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United States
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Agricultural
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Beltsville Agricultural
Research Center

Beltsville, Maryland

June 1985

National Potato Germplasm Evaluation and Enhancement Report, 1984

Fifty-fifth Annual Report
by Cooperators

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UNITED STATES DEPARTMENT OF AGRICULTURE
BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC), BELTSVILLE,
MARYLAND, AND CHAPMAN AND AROOSTOOK FARMS, PRESQUE ISLE, MAINE

Raymon E. Webb and Robert W. Goth, BARC, and David Wilson and
Gene Lunney, Presque Isle, Maine

BARC

Breeding and Evaluation: One hundred thirty-six parents selected for their multigenic resistance to late blight and/or dominant gene resistance to potato virus Y (PVY) were planted to cross with high quality, widely adapted, round white and russet breeding lines also possessing resistance, singly or in combination, to potato virus A (PVA), potato virus X (PVX), scab, Verticillium wilt, tuber heat necrosis, etc.

Four hundred sixty-seven parental combinations were successful, resulting in about 400,000 true seed. Progenies of 98 parental russet x russet combinations (involving multipest resistance and good quality) were grown during the fall in the greenhouse. About 38,000 seedling tubers were produced. About 8,000 A-size tubers are to be planted in Maine during 1985. The remaining tubers have been distributed to Colorado, Minnesota, North Carolina, and New York for selection under their environmental conditions. Twelve true seed lines, emphasizing resistance to PVY, were shared with Minnesota and 14 with ARS, Prosser, Washington.

Eighty-six selections, highly resistant to PVX and PVY and surviving the third cycle of selection for improved horticultural characteristics, were rescreened for PVX and PVY resistance. All selections proved resistant to both viruses, and 11 selected clones were entered in pertinent crossing blocks. One hundred fifty-two new selections, including tuberosum x gourlyii hybrids, from populations segregating for resistance to PVX, PVY, and other diseases were screened (four successive mechanical inoculations) for resistance to PVX, PVY, and potato virus M (PVM). Seventy-nine clones were resistant to PVX, 91 were resistant to PVY, and 19 were resistant to PVM. Seventy-three clones were resistant to both PVX and PVY, and 13 clones were resistant to all three viruses. Cuttings have been made for further tests on PVM-resistant clones. Another group of 56 clones was screened for resistance to PVX and potato virus S (PVS). Thirty-three were resistant to PVX, and three were resistant to PVS. Cuttings have been made of the PVS-PVX-resistant clones for graft inoculation studies.

Thirty-four selections, highly resistant to late blight both in the greenhouse and field, were screened for resistance to PVX and PVY. Twenty-three clones were resistant to PVX, and 19 were resistant to PVY. Twelve clones were resistant to both viruses. ELISA was used for the most part in detecting virus infections.

The virus-tested clones are among a larger group of materials selected from progenies segregating for resistance to race A of the golden nematode. These are being submitted to Dr. William Brodie, ARS, Cornell University, for golden-nematode-resistance tests in 1985.

Baking quality evaluations on 40 advanced russet selections indicated continued improvement in this characteristic on materials destined for the count-box trade.

Presque Isle

Chapman Farm: Chapman selection and seed increase plantings were rogued a number of times by Maine Department of Agriculture foundation seed production personnel, and minimal virus infiltration was noted, according to winter Florida tests. Seed increases were very good in 1984. Quality (chip, french fry, and specific gravity) evaluations indicated a positive shift toward improved quality, particularly, among long, smooth russet materials. Fourteen new round white selections harvested 85 days after planting chipped quite well from 4 months' storage at 40° F. These were included in the 1985 high quality, pest-resistant crossing block.

Approximately 200 clones of diverse parentage were selected for observational, preliminary, and advanced trials with cooperators in Florida, Virginia, New Jersey, New York, and Maine. Seed of 58 clones were advanced to Echo Lake for seed increases preliminary to potential grower trial evaluations in 1986-87. Seed of 14 clones were entered in the Maine Department of Agriculture's meristem culture program. Several seed lots of promising materials were furnished to growers in Maine, Wisconsin, California, and Nebraska.

Foundation seed of NemaRus (B9540-62) was made available to breeders and foundation seed producers.

Aroostook Farm: Maintenance of older potato varieties and breeding lines continued. Dr. Robert W. Goth is indexing each item, via ELISA, for natural infection with the latent potato viruses. A number of varieties were shared with others for specific purposes.

Scab, late blight, and Verticillium-pinkeye resistance evaluations were conducted on approximately 200 clones. About 10 percent of the clones appeared to equal Superior in resistance to scab, 34 clones were highly resistant to blight, and 14 clones were equal to Abnaki in resistance to Verticillium wilt. Incidence of pinkeye was minimal due to dry conditions in August and September (Table 1.)

Specific gravity determinations, chip, and french fry capability were done on most of the clonal inventory, including yield trial entries (Tables 2-5).

Echo Lake: Two yield trials each of round whites (Tables 2 and 3) and russets (Tables 4 and 5) were conducted on Echo Lake. Inadequate rainfall in August and September and an early frost (109 days after planting) limited yields somewhat. Russet clones B9540-55, B9540-62, and B9596-2 continue to produce good yields of well-shaped tubers. B9540-62 has been released to foundation seed growers as the variety NemaRus. It is resistant to race A of the golden nematode, virus X, and Fusarium tuber rot. In the round white trials, advanced clones B9140-32, B9192-1, B9340-13, WF31-4, WF46-3, and WF46-4 continue to show promise. These are in advanced interregional grower trials in 1985. The B9792 clonal series (Table 3) is being studied for potential for processing directly from extended storage at 40° F and for rapidity in reconditioning at 60° F once the clones have gone "off-grade" at 40° F. Several of the clones are in interregional yield trials in 1985.

A number of both round white and russet clones increased at Echo Lake were made available to seed growers for preliminary commercial production and storage trials in 1985.

Summary

Program emphasis continues to be centered around incorporating genes for resistance to disease and race A of the golden nematode, primarily, in round white and long russet types of high quality and wide adaptation. Red-skin types were entered into the program in 1982. Resistance to the major viruses, including M and S and field resistance to late blight, are in the gene pool of high quality breeding stocks. Progress should gain momentum in assembling significant gene combinations in desired tuber types for specific uses and areas of production. New research efforts will be oriented toward control of soilborne diseases through host resistance.

In 1985-86 final decisions will be made on the future of round white clones B9140-32, B9192-1, B9340-13, WF31-4, WF46-3, and WF46-4 and russet clones B9450-55, B9553-6, B9569-2, B9596-2, B9720-3, B9740-5, and B9752-7. Newer clones of both tuber types are available for extensive evaluations.

BARC Table 1. Weekly average maximum and minimum temperature and and total weekly rainfall, Aroostook Farm, Presque Isle, Maine, 1984.

Week Ending	Avg. Temperature F		Rainfall
	Min.	Max.	Inches
May 1-7	56.1	33.7	1.28
8-14	61.4	39.1	1.78
15-21	58.7	37.7	.50
22-28	77.9	42.1	.20
29-June 4	58.1	43.4	4.47
June 5-11	80.3	56.6	.02
12-18	74.0	41.6	.81
19-25	71.0	42.9	1.62
26-July 2	73.4	51.9	.33
July 3-9	78.1	62.3	1.70
10-16	77.6	56.6	1.62
17-23	79.4	58.0	.54
24-30	72.6	53.3	1.55
31-Aug. 6	82.9	56.6	.46
Aug. 7-13	80.1	61.7	.66
14-20	75.0	56.9	1.44
21-27	76.0	50.9	.20
28-Sep. 3	74.6	54.7	.18
Sep. 4-10	69.9	45.1	.19
11-17	63.7	42.6	.12
18-24	64.7	41.9	.42
25-Oct.1	61.0	34.3	.27
Total			20.36

BARC Table 3. Yield, tuber size, distribution, and quality characteristics of round whites harvested 109 days after planting, Echo Lake, 1984.

Pedigree	Mkt CWT/A	%	Tuber size distribution						Tuber Rating ¹	Spec Grav ²	Chip Color ³			
			1-7/8"-2-1/4"			2-1/4"-3-1/4"					50°F 2 mos	45°F direct	40°F direct	60°F 14 das
			<1-7/8"	1-7/8"	2-1/4"	3-1/4"	4"	>4"						
B9792-1B	310.9	90.1	8.2	30.8	56.3	3.2	0.0	5	95	5.6	7.7	8.4	8.4	
" -2B	302.5	88.7	9.5	30.3	52.0	6.2	1.9	5	102	5.9	6.6	8.0	6.4	
" -8B	395.4	94.3	5.1	22.0	59.2	13.2	1.0	3	96	6.2	6.9	8.2	8.0	
" -13B	346.4	92.1	6.0	21.8	50.0	20.6	1.9	3	94	5.8	6.7	7.2	6.2	
" -16B	337.3	93.1	7.1	24.9	56.1	12.1	0.0	4	93	6.5	7.4	8.0	7.4	
" -17B	272.2	87.2	13.0	47.9	37.8	1.5	0.0	5	95	6.2	7.0	8.0	7.8	
" -27B	330.2	91.5	6.6	27.9	55.8	8.0	2.1	6	96	5.4	6.7	7.8	8.4	
" -53	310.3	90.4	9.6	28.8	59.0	2.6	0.0	4	101	5.4	6.2	7.6	7.4	
" -61	351.5	91.6	7.7	27.6	57.5	6.7	1.0	5	91	5.4	6.3	8.2	6.6	
" -69	291.5	86.9	12.3	34.6	46.0	6.4	1.0	3	96	6.5	7.4	8.4	7.2	
" -79	268.3	86.8	12.7	34.2	49.1	3.5	1.0	5	91	6.2	7.3	7.8	7.0	
" -95	292.8	85.5	6.4	33.9	42.9	8.7	1.0	6	91	5.4	6.6	7.8	7.6	
" -97	260.6	84.2	15.8	35.2	40.6	8.5	0.0	5	86	6.5	7.8	7.8	8.0	
" -132	305.7	90.8	9.6	27.0	58.2	5.8	0.0	4	86	6.4	7.8	8.4	7.8	
" -136	358.6	89.8	4.4	13.4	48.3	28.1	6.0	6	79	6.7	7.6	8.6	9.2	
" -144	384.4	90.2	5.9	17.4	56.7	16.0	3.9	5	77	6.6	8.2	8.6	8.4	
" -157	301.2	89.6	10.6	31.5	53.4	4.8	1.0	4	88	5.7	6.3	7.0	-	
" -196	220.6	77.4	22.4	42.1	32.8	2.7	0.0	5	90	5.3	6.1	7.6	6.4	
Atlantic	313.5	89.3	7.2	15.8	53.1	20.4	3.7	7	92	6.5	7.5	8.6	7.8	
Belchip	385.1	91.6	6.9	19.6	51.7	20.4	1.4	4	91	5.6	7.1	8.5	7.1	
Chipbelle	338.0	87.3	12.3	40.3	43.0	3.8	1.0	4	100	6.0	7.3	8.4	7.4	
LSD 5%	59.2													

See footnotes Table 2.

BARC Table 4. Yield, tuber size, distribution, and quality characteristics of russets harvested 109 days after after planting on Echo Lake, 1984.

Pedigree	Mkt CWT/A	% Mkt	Tuber size distribution							Tuber Rating ¹	Spec Grav ²	50°F		45°F		40°-60°F	
			<2 oz.	2- 6 oz.	6- 10 oz.	10- 16 oz.	>16 oz.	2 mos	Col ³			Tex ⁴	5 mos	direct	21 days		
B9391-2	253.9	84.5	10.4	39.5	36.9	8.3	5.0	6	87		3.2	2.3	3.8	2.0	3.7	2.0	
B9398-2	241.7	80.5	16.8	31.5	35.2	13.7	3.9	4	91		2.2	1.9	3.3	2.0	2.9	2.0	
B9539-9	231.2	82.9	17.1	42.9	35.0	5.0	0.0	5	80		2.4	1.9	3.5	2.0	2.9	2.0	
" -14	300.4	84.6	14.4	45.2	34.0	5.4	1.0	6	84		4.4	1.9	4.7	2.0	5.0	2.1	
B9540-29	234.7	80.2	10.9	25.6	35.5	19.2	8.7	6	79		3.1	1.9	3.2	2.0	2.6	2.1	
" -55	273.7	81.3	12.9	27.3	32.6	21.6	22.6	6	70		3.0	1.8	3.7	2.0	2.2	2.0	
" -62	284.7	79.0	6.0	21.5	36.8	20.7	15.0	6	74		2.8	1.9	3.4	2.0	3.4	2.0	
B9553-6	248.7	84.9	13.1	32.5	37.9	14.7	2.0	5	75		2.6	1.9	3.7	2.0	2.6	2.0	
B9563-2	276.0	81.5	4.8	19.4	40.1	22.1	13.7	6	76		3.5	2.0	4.7	2.0	4.1	2.0	
B9569-2	214.4	77.4	18.0	43.2	28.5	5.7	4.6	6	71		4.3	2.0	4.8	2.0	4.3	2.0	
B9596-2	296.9	85.9	10.4	38.5	35.6	11.8	3.9	7	77		3.5	1.8	4.4	2.0	4.1	2.0	
B9548-9	286.4	78.8	9.4	24.6	31.3	22.8	12.0	6	74		3.0	2.0	3.7	2.0	3.5	2.0	
B9729-6	194.6	83.1	12.9	33.5	38.2	11.4	4.2	5	79		2.6	1.8	3.2	2.0	2.9	2.0	
BelRus	228.9	85.3	13.2	43.9	32.9	8.4	1.0	7	84		2.1	1.8	3.6	2.0	3.0	2.0	
Russette	302.1	86.2	3.6	23.1	44.6	18.7	10.1	4	86		3.6	1.9	3.9	2.0	3.8	2.0	
LSD 5%	54.0																

¹ = poor; 9 = outstanding

² = 1.0 omitted

³ French fry color: 1-3 = satisfactory

⁴ Texture: 1-2 = satisfactory

BARC Table 5. Yield, tuber size, distribution, and quality characteristics of russets harvested 109 days after after planting on Echo Lake, 1984.

Pedigree	Mkt CWT/A	%	Tuber size distribution					French Fry									
			<2 oz.	6 oz.	10 oz.	16 oz.	>16 oz.	Tuber Rating ¹	Spec Grav ²	50°F		45°F		40°-60°F			
										2 mos	Col ³	2 mos	Col ³	direct	21 days		
																Tex ⁴	Tex ⁴
B9738-2	172.6	76.4	23.5	40.8	25.5	10.4	0.0	5	80	2.7	2.0	4.1	2.0	3.6	2.0		
B9740-4	234.1	84.8	9.5	33.1	37.1	14.9	5.7	4	79	3.2	2.0	3.9	2.0	3.4	2.0		
" -5	273.1	81.9	17.2	34.4	34.1	11.2	3.3	5	95	1.8	1.6	3.5	2.0	2.2	2.0		
B9744-1	253.9	82.6	8.1	35.5	31.0	19.7	6.8	4	77	2.9	1.9	3.9	2.0	3.9	2.0		
B9750-1	234.1	79.2	13.6	26.3	30.3	22.6	7.1	4	66	3.6	2.0	3.8	2.0	3.4	2.0		
B9922-11	338.7	86.9	4.0	21.3	40.5	25.2	9.1	5	89	2.4	2.0	3.7	2.0	3.2	2.0		
" -14	261.5	86.5	10.8	38.5	38.5	11.0	2.3	5	74	3.1	1.9	4.1	2.0	3.2	2.0		
B9924-9	207.4	84.6	11.6	41.2	34.8	8.3	3.8	5	74	1.8	2.0	3.6	2.0	2.3	2.0		
" -20	248.7	78.8	22.1	44.6	27.8	5.5	0.0	4	79	3.5	2.0	4.0	2.0	4.0	2.0		
B9925-10	161.5	70.2	28.8	53.8	14.4	2.0	0.0	4	85	2.9	2.0	3.7	2.0	2.9	2.0		
B9926-11	283.5	91.9	9.4	29.4	47.5	11.3	0.0	4	80	2.6	1.9	3.7	2.0	2.7	2.0		
" -13	174.9	76.8	23.2	49.2	44.4	1.5	0.0	5	83	2.0	1.6	3.9	2.0	2.7	2.0		
" -21	203.4	84.8	13.8	47.9	29.3	7.8	1.5	4	99	1.3	1.6	2.1	1.7	1.8	1.6		
B9927-16	206.0	86.4	11.4	32.1	34.6	19.7	0.9	5	70	4.2	2.0	4.7	2.2	4.1	2.0		
GoldRus	168.1	71.6	19.0	35.1	29.6	13.1	3.0	7	83	2.3	2.0	3.3	2.0	2.6	2.0		
LSD 5%	56.9																

See footnotes Table 4

INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

R. W. Ross and R. E. Hanneman, Jr.

Introduction of New Stocks

One hundred fifty-two introductions were added to the collection -- 127 in the form of true seed, the remainder as either tuber clones or meristem cultures. Most were acquired from the most recent expeditions collecting tuber-bearing Solanums in Mexico (82 accessions) and Argentina (56 accessions).

Preservation and Increase of Stocks

Approximately 90 percent of the introductions contained in the collection are maintained as true seed. Satisfactory seed increases of 178 species introductions and intraspecific hybrids were obtained under glass, fiberglass or screen.

A 1000-seed sample, packaged from the most recent seed increase, of each of 1,192 accessions was forwarded to the National Seed Storage Laboratory (NSSL). This seed will supersede older seed samples held by the NSSL. Germination percentages of 1,230 seed lots 2-24 years of age were determined.

One hundred and eighty-one accessions have been placed into shoot-tip culture, 28 into meristem culture and 133 into long-term storage. Two hundred and fifty-four accessions have been tested for PVS, PVX, PVY, PVA, PVM and PLRV by ELISA. Six hundred and thirty-two dot blot DNA hybridization tests were made to check for the presence of potato spindle tuber viroid (PSTV) among all plants used for seed and tuber increases as well as the resultant true lots produced. Forty-nine lines now have been found to be free of the viruses and viroid tested for above. A test history for those done on clonal stocks has been prepared and will be updated regularly.

Classification

Herbarium specimens of 55 of the Bolivian collections provided earlier by Solanum taxonomist J. G. Hawkes were prepared, at his request, for further study and inclusion in his species herbarium. Dr. Hawkes spent two weeks here classifying a large group of recent Bolivian and Mexican acquisitions. Another 124 specimens of this group were prepared for inclusion in the herbarium here.

Another 151 herbarium specimens were made at 89 collection sites across several Mexican States. All are included in the well over 4,000 herbarium mounts, representing specific and inter-specific variability of 111 species, now available for taxonomic use.

Distribution of Stocks

Seed and tuber shipments were sent to potato workers in 19 states within this country, as well as to those in 16 other countries, in response to requests. Shipments included 3,624 seed and 1,222 tuber samples of species introductions, and 87 tuber samples of germplasm involving species introductions,

developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project.

Copies of a listing of 238 species introductions available this year in the form of tuber families as well as true seed were distributed to 322 potato workers. The responses this mailing elicited wholly depleted the tuber families offered.

Evaluation of Stocks

The somatic chromosome numbers of 340 accessions not previously recorded, was determined the laboratory. Just over 9,100 seeds and tuber samples were distributed under contract, with funds from USDA, ARS and Special Grant funds from USDA, CSRS, to state and federal laboratories for screening for resistance to Colorado potato beetle, potato leafroll virus, Verticillium wilt and rootknot nematode. The more recent accessions are being steadily evaluated for characters of economic importance through the cooperative efforts of state, federal and foreign laboratories.

Usefulness of Findings

The major objective of the Inter-Regional Potato Introduction Project is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir of useful breeding stocks. Breeders are constantly searching for new sources of superior germplasm and for ways to incorporate desirable new genes into adapted commercial varieties. Accomplishment of the major objective of this program must be measured largely by the success with which new improved varieties meet the needs of commercial production.

Three new potato varieties, Campbell 14, Russette and Sunrise, were released for commercial production in 1984. The number of foreign introductions entering into their pedigrees are 10, 10, and 13, respectively. One hundred sixty-two of the 166 potato varieties developed and released in the United States since 1932 have two or more foreign introductions in their pedigree. These varieties presently comprise about 65 percent of the annual seed potato production in the United States.

Basic research programs conducted in several states and other countries continue to provide information concerning the potential value and diversity of the Solanum species, and consequently the knowledge necessary for more effective utilization of the IR-1 germplasm collection. During 1984, 30 papers, 33 abstracts and 7 theses reported the use of Solanum introductions.

NORTH CENTRAL REGIONAL POTATO TRIALS

R.H. Johansen and Cooperators^{1/}

Potato Cultivar
Trials

The North Central Regional Potato Cultivar Trials have been in existence for the past 34 years and North Dakota State University has coordinated these trials for the past 23 years. There are now 13 States and two Provinces conducting the trials, however, this past season the trial at Missouri was lost due to poor weather and growing conditions.

Potato cultivars released were:

REDDALE

Progeny Number: MN 8757
Released by: Minnesota
Parentage: Erick X Chieftain
Year Released: 1984

TOLASS

Progeny Number: MN 7973
Released By: Minnesota
Parentage: Neb. 16.55-1 X MN 1106.64-1
Year Released: 1984

AGASSIZ

Progeny Number: MN 8586
Released By: Minnesota
Parentage: MN 3216.64-11 X MN 305.64-11
Year Released: 1983

ERIK

Progeny Number: MN 4536
Released By: Minnesota
Parentage: ND4524-7R X 4620-2
Year Released: 1983

KRANTZ

Progeny Number: MN 9648
Released By: Minnesota
Parentage: MN 366.65-3 X GC 743-5
Year Released: 1985

^{1/}— Kansas, Dr. J.K. Greig; Louisiana, Dr. James Fontenot; Michigan, Dr. Richard Chase; Minnesota, Dr. Florian Lauer; Missouri, Dr. V.N. Lambeth; Nebraska, Dr. R.B. O'Keefe; Ohio, Mr. E. C. Wittmeyer; South Dakota, Dr. Paul Prashar; Wisconsin, John Schoenemann, Mr. Donald Kichefski, Stan Peloquin; Alberta, Mr. Clive Schaupmeyer; Manitoba, Mr. Brian Rex; Indiana, Dr. Homer Erickson; Iowa, Dr. Bill Summers; Colorado, Mr. Dan Sullivan; Kentucky, Dr. John Snyder.

LANGLADE

Progeny Number: Wisc. 718

Released By: Wisconsin

Parentage: Kennebec X Wisc. 631

Year Released: 1985

Cooperating States and Provinces:

State or Province	Date Planted	Date Harvested	Total Days to Harvest
Alberta	5/8	10/2	148
Manitoba	5/18	9/2	108
Colorado	5/5	9/8	128
Indiana	5/15	10/2	141
Iowa	4/20	8/31	150
Kansas	4/6	8/1	118
Kentucky	4/26	9/12	140
Louisiana	3/8	6/15	100
Michigan	5/8	9/21	137
Minnesota	4/24	8/29	128
Missouri*	--	--	--
Nebraska	5/24	9/20	118
North Dakota	5/16	9/20	126
Ohio	5/15	9/20	129
South Dakota	5/15	9/18	127
Wisconsin	4/26	9/24	152

*Lost due to poor weather conditions.

Environmental Conditions: Soil type ranged from clay loam to sand. Most trials were planted on sandy or silt loam. Colorado, Indiana, Iowa, Kansas, Michigan, South Dakota and Wisconsin all applied irrigation water.

Cultural Practices: Fertilizers, fungicides, insecticides, vine killers, herbicides, etc., were all based on local conditions. Insecticides commonly used were Temik, Decis, Malathion, Tihodan, Pydrin, Sevin, Imidan, Cyon, Di-Syston, Phosphamidan and Guthion. Fungicides used were Difolatan, Sulfur, Bravo, Manex, Dithane M-45, Ridomil and the herbicides used were Lorox-Lasso, Dual, Sencor, Lexone, Poast and Eptam. Vines were killed by mechanical means and the chemicals Reglone and Diquat.

Weather and Growing Conditions: The trial in Missouri was lost due to wet and poor growing conditions. Last year trials were lost in four states. In general, growing conditions were good at most locations. Rainfall was ample and temperatures were favorable throughout the season. In some areas, it was

dry during July and August but above or near normal during the early part of the season. In Louisiana, temperatures were good for potato production and rainfall was such that irrigation was not necessary.

Entries: Entries were received from Louisiana, Minnesota, Nebraska, North Dakota and Wisconsin. North Dakota supplied the check cultivars Norchip, Norland, Norgold Russet, Red Pontiac and Russet Burbank.

Total and U.S. No. 1 Yield: Red Pontiac produced the highest total and U.S. No. 1 yield. La 01-38 was the next highest yielding entry. Wisconsin and Minnesota produced the highest yields. Total and U.S. No. 1 yields are found in North Central Regional Tables 1 and 2.

Percent U.S. No. 1: Wisconsin and Minnesota reported the highest percent U.S. No. 1 and Iowa again reported the lowest. La. 01-38 had the highest percent U.S. No. 1 (North Central Regional Table 3).

Maturity: Maturity readings are found in North Central Regional Table 4. Norland was the earliest maturing entry; however, several selections that were supposed to be late were actually medium-early in maturity.

Percent Total Solids: BN 9803 reported the highest percent total solids and Norland the lowest. Manitoba was the highest and Louisiana and Iowa the lowest in percent total solids (North Central Regional Table 5).

Scab Reaction: Indiana and Ohio reported the highest incidence of scab. Several States and Provinces reported little or no scab (North Central Regional Table 6).

Summary of Grade Defects: Grade defects are found in North Central Regional Table 7. Again, certain selections or cultivars are starred (*) to point out various external or internal defects.

Chip Quality: Several selections like ND860-2, W855, La. 01-38, Minn. 11795, Neb. 26.72-1 and W779 were equal or better than Norchip in chip quality (North Central Regional Table 8).

Early Blight Readings: Most locations did not report any early blight. Data indicated that certain selections are more susceptible or more resistant to early blight (North Central Regional Table 9).

Overall Merit Ratings^{1/}: Merit ratings for 1984 are found in North Central Regional Table 10. La. 01-38 received the highest merit rating followed by ND534-4Russ and ND388-1Russ. The following five entries received the highest merit ratings in 1984. Data is also included for 1982 and 1983.

<u>Cultivar or Selection</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
La. 01-38	--	15	35
ND534-4Russ	41	24	34
ND388-1Russ	24	20	27
W 779	--	10	22
ND860-2	--	--	15

1/ Merit Ratings

<u>Rating</u>	<u>Points</u>
1	5
2	4
3	3
4	2
5	1

North Central Regional Trial Table 1. Total Yield (Cwt./Acre) - 1984.

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI	Ave.
<u>Early to Medium Early</u>																
Norland	141	89	336	308	144	215	202	161	387	336	399	242	274	191	423	257
<u>Medium to Late</u>																
La. 01-38	395	77	482	335	251	289	407	167	485	525	431	266	345	341	540	356
La. 82-119	236	67	395	228	180	326	352	164	406	463	176	244	283	207	550	285
MN 10874	249	89	327	264	161	172	208	139	369	474	360	300	311	352	453	282
MN 11373	210	66	342	377	198	197	345	137	434	511	423	302	385	229	508	311
MN 11795	219	61	309	235	123	232	222	130	333	448	340	260	253	274	417	257
NE 9.72-1	257	96	467	299	242	317	282	NR	415	419	362	323	267	103	514	312
NE 26.72-2	154	47	232	159	157	88	217	NR	367	408	289	217	140	160	484	223
BN 9803	257	53	391	273	162	238	121	NR	344	439	308	244	180	192	444	260
ND388-1Russ	208	98	342	276	238	216	298	246	441	425	363	292	243	367	431	299
ND534-4Russ	270	68	355	271	219	243	258	102	398	471	359	344	286	345	484	298
ND860-2	207	62	324	192	203	283	263	214	292	324	263	217	176	207	324	237
W 779	274	94	366	273	208	234	231	214	467	452	378	324	204	276	494	299
W 855	212	73	327	329	177	264	149	152	413	384	495	154	262	350	499	283
Red Pontiac	295	118	455	513	320	284	307	257	561	597	667	354	316	327	636	400
Norchip	259	78	355	284	188	287	264	230	396	418	378	299	288	225	505	297
Russet Burbank	163	78	376	302	190	210	371	134	484	584	375	217	330	457	612	326
Norgold Russet	248	90	348	245	246	290	159	260	348	415	265	306	298	187	349	270
Average	236	78	363	287	200	244	259	180	408	450	368	273	269	266	482	292

NR - Not Received

North Central Regional Trial Table 2. U.S. No. 1 Yield (Cwt/Acre) - 1984.

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI	Ave.
<u>Early to Medium Early</u>																
Norland	117	81	321	290	63	155	183	110	366	318	307	203	225	163	407	221
<u>Medium to Late</u>																
Ia. 01-38	344	66	459	291	132	177	388	148	476	509	263	256	276	321	524	309
Ia. 82-119	164	48	386	162	42	182	287	122	368	423	102	225	195	183	515	227
MN 10874	175	72	323	185	37	73	169	70	261	444	234	282	121	319	424	213
MN 11373	128	25	336	313	75	95	292	86	307	420	228	243	246	176	442	227
MN 11795	66	26	303	160	38	67	166	69	167	358	146	215	53	174	318	155
NE 9.72-1	200	68	436	251	106	233	249	NR	378	400	239	271	160	94	496	256
NE 26.72-2	90	27	182	113	30	43	184	NR	312	356	118	164	52	123	432	159
BN 9803	203	41	386	232	55	141	102	NR	320	413	203	204	65	165	427	211
ND388-1Russ	157	82	330	246	100	128	267	182	348	384	236	266	172	321	400	241
ND534-4Russ	215	53	332	230	118	168	239	57	327	450	201	313	183	280	455	241
ND860-2	156	49	318	173	105	191	226	166	238	297	137	169	129	160	300	188
W 779	223	71	293	224	106	166	202	153	375	437	261	255	131	245	479	241
W 855	132	39	327	290	61	147	132	118	355	345	351	126	191	307	472	226
Red Pontiac	243	107	413	477	198	213	282	160	536	584	307	333	221	290	611	332
Norchip	182	53	297	256	87	178	238	137	326	400	174	253	135	189	482	226
Russet Burbank	123	61	324	251	11	126	327	82	262	493	139	176	125	370	554	228
Norgold Russet	193	58	344	194	115	131	130	126	281	381	174	228	214	145	317	202
Average	173	57	339	241	82	145	226	119	334	412	212	232	161	224	448	228

North Central Regional Trial Table 3. Average Percent U.S. No. 1 (over 2" Diameter) - 1984.

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI	Ave.
<u>Early to</u>																
<u>Medium Early</u>																
Norland	83	91	96	94	44	72	80	68	95	95	77	84	82	85	96	83
<u>Medium to Late</u>																
La. 01-38	87	86	95	87	53	61	95	89	98	97	61	96	80	94	97	85
La. 82-119	70	71	98	71	24	56	81	74	91	91	58	92	69	88	94	75
MN 10874	70	80	99	70	23	42	81	50	70	94	65	94	39	91	94	71
MN 11373	61	37	98	83	38	48	85	63	71	82	54	80	64	77	87	69
MN 11795	30	43	98	68	31	29	74	53	50	80	43	83	21	64	76	56
NE 9.72-1	78	71	93	84	44	74	89	NR	91	95	66	84	60	91	96	80
NE 26.72-2	58	51	76	70	19	49	85	NR	85	87	41	76	37	77	89	65
BN 9803	79	76	97	85	34	59	85	NR	93	94	66	84	36	86	96	76
ND388-1Russ	75	84	97	89	42	59	89	74	79	91	65	91	71	87	93	79
ND534-4Russ	80	78	94	85	54	69	92	56	82	95	56	91	64	81	93	78
ND860-2	75	80	98	90	52	67	85	78	81	92	52	78	73	77	93	78
W 779	81	77	80	82	51	71	86	72	80	97	69	79	64	89	97	78
W 855	62	53	100	88	35	56	89	78	86	90	71	82	73	88	95	76
Red Pontiac	83	91	91	93	62	75	92	62	96	98	46	94	70	89	96	83
Norchip	70	68	84	90	46	62	90	60	82	96	46	85	47	84	95	74
Russet Burbank	75	78	86	83	6	60	88	61	54	84	37	81	38	81	91	67
Norgold Russet	78	65	99	79	47	45	83	48	81	92	66	75	72	78	91	73
Average	72	71	93	83	39	59	86	66	81	92	58	85	59	84	93	75

North Central Regional Trial Table 4. Maturity Classification^{1/} - 1984.

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI	Ave.
Early to Medium Early																
Norland	3.0	ND	1.0	1.8	1.0	2.0	1.0	1.0	1.0	ND	1.5	2.4	1.0	1.0	1.0	1.4
Medium to Late																
La. 01-38	3.5	ND	2.5	4.0	4.0	4.5	5.0	4.0	4.0	ND	3.8	4.5	4.0	3.0	3.0	3.8
La. 82-119	3.5	ND	2.0	2.8	3.0	4.5	3.0	4.0	4.0	ND	2.8	3.8	2.0	1.0	4.0	3.1
MN 10874	4.0	ND	2.8	3.5	3.0	4.8	3.0	4.0	5.0	ND	3.3	3.3	3.0	4.0	3.0	3.6
MN 11373	3.5	ND	3.6	4.0	3.0	4.0	4.0	3.0	4.0	ND	4.0	3.0	5.0	2.0	3.0	3.5
MN 11795	3.0	ND	1.1	2.5	1.0	2.5	1.0	1.0	2.0	ND	3.0	2.5	2.0	2.0	2.0	2.0
NE 9.72-1	4.0	ND	1.9	3.8	2.0	4.8	3.0	NR	4.0	ND	3.8	3.8	4.0	1.0	3.0	3.3
NE 26.72-2	4.0	ND	5.0	5.0	2.0	5.0	4.0	NR	4.0	ND	4.3	4.3	5.0	5.0	3.0	4.2
BN 9803	3.0	ND	2.2	2.8	3.0	2.8	2.0	NR	3.0	ND	2.5	3.0	2.0	2.0	3.0	2.6
ND388-1Russ	3.5	ND	1.5	3.8	3.0	3.3	3.0	4.0	2.0	ND	2.5	3.8	2.0	2.0	3.0	2.9
ND534-4Russ	2.5	ND	2.0	3.0	3.0	4.5	3.0	4.0	2.0	ND	3.0	3.3	2.0	3.0	3.0	2.9
ND860-2	3.0	ND	1.0	2.5	2.0	4.5	3.0	3.0	1.0	ND	1.3	3.8	3.0	1.0	3.0	2.5
W 779	3.5	ND	2.9	4.2	4.0	4.8	3.0	4.0	4.0	ND	3.8	4.3	4.0	4.0	5.0	4.0
W 855	4.0	ND	4.9	4.0	4.0	4.8	3.0	5.0	4.0	ND	4.5	4.4	4.0	4.0	5.0	4.3
Red Pontiac	4.0	ND	3.0	4.2	3.0	5.0	3.0	4.0	3.0	ND	4.5	4.3	3.0	3.0	3.0	3.6
Norchip	3.0	ND	2.6	3.2	2.0	4.0	3.0	4.0	3.0	ND	3.0	3.0	3.0	3.0	3.0	3.1
Russet Burbank	4.5	ND	5.0	5.0	5.0	5.0	5.0	5.0	4.0	ND	5.0	5.0	5.0	5.0	5.0	4.9
Norgold Russet	3.5	ND	1.4	2.2	3.0	3.5	2.0	3.0	2.0	ND	3.5	3.3	ND	2.0	2.0	2.6
Average	3.5		2.6	3.5	2.8	4.1	3.0	3.5	3.1		3.3	3.7	3.2	2.7	3.2	3.2

- 1/ 1. Very early - Norland Maturity
 2. Early - Irish Cobbler Maturity
 3. Medium - Red Pontiac Maturity
 4. Late - Katahdin Maturity
 5. Very Late - Russet Burbank Maturity

ND - No Data
 NR - Not Received

North Central Regional Trial Table 5. Percent Total Solids - 1984

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI	Ave.
<u>Early to</u>																
<u>Medium Early</u>																
Norland	20.6	21.2	19.1	14.5	12.3	15.3	16.1	15.4	16.9	16.2	16.7	19.0	17.3	15.7	16.0	16.8
<u>Medium to Late</u>																
La. 01-38	22.3	24.1	22.4	18.6	17.8	18.6	19.2	15.4	21.8	21.4	20.7	22.9	19.0	20.0	20.5	20.3
La. 82-119	23.4	24.5	21.6	18.3	17.1	15.4	18.8	16.5	20.7	19.5	20.1	21.4	20.2	17.9	19.4	19.7
MN 10874	21.4	23.0	21.8	16.6	16.5	18.5	19.9	15.6	20.5	19.2	20.3	22.2	19.8	18.4	19.0	19.5
MN 11373	22.0	23.3	22.2	18.8	17.1	18.4	20.0	16.7	20.3	19.7	20.3	22.2	18.7	20.0	19.9	20.0
MN 11795	22.0	23.7	20.6	16.9	16.6	23.7	19.6	17.1	19.2	19.2	19.2	21.8	20.0	18.4	18.6	19.8
NE 9.72-1	20.6	20.0	19.3	14.4	15.5	16.2	16.7	NR	17.6	16.7	17.5	19.4	18.3	16.7	16.2	17.5
NE 26.72-2	20.6	19.2	22.6	17.7	19.3	19.0	20.5	NR	21.0	19.5	20.1	22.2	19.2	20.0	20.3	20.1
BN 9803	24.3	24.5	22.4	17.7	17.6	18.8	20.5	NR	21.4	22.2	19.9	23.3	20.2	20.0	21.4	21.0
ND388-1Russ	22.2	23.3	21.8	17.7	15.7	16.2	19.3	16.0	21.4	19.2	19.7	21.6	18.5	19.0	18.8	19.4
ND534-4Russ	20.8	23.1	20.1	16.0	16.7	18.2	20.0	15.6	19.6	18.6	17.3	21.6	18.5	18.4	18.0	18.8
ND860-2	22.7	23.7	21.2	16.9	16.3	19.0	19.6	18.6	20.5	19.0	19.7	21.6	19.2	18.8	19.2	19.7
W 779	21.3	23.7	21.2	16.5	17.1	18.2	17.7	15.4	20.7	20.5	19.9	21.4	18.3	18.8	19.0	19.3
W 855	23.4	25.0	24.9	19.9	19.2	22.4	22.0	19.0	23.8	21.4	21.8	24.2	20.2	21.5	21.8	18.4
Red Pontiac	18.9	21.5	19.5	15.9	18.3	15.0	17.6	15.4	19.0	16.2	17.5	20.2	16.2	16.7	17.1	17.7
Norchip	22.9	22.6	22.4	18.6	12.7	17.7	20.2	15.6	21.2	19.7	19.0	22.7	19.6	18.4	20.7	19.6
Russet Burbank	21.1	22.6	22.2	18.1	16.4	18.0	20.5	15.6	22.2	21.8	18.2	21.2	ND	21.0	19.9	19.9
Norgold Russet	21.4	22.2	19.7	15.0	14.8	15.0	17.2	15.4	18.8	18.0	17.5	20.5	19.0	17.3	16.7	17.9
Average	21.8	22.8	21.4	17.1	16.5	18.0	19.2	16.2	20.4	19.3	19.2	21.6	19.0	18.7	19.0	19.2

NR - Not Received

ND - No Data

North Central Regional Trial Table 6. Scab Reaction Report. Most Representative Scab (Area-Type)^{1/} - 1984.

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI
<u>Early to Medium Early</u>															
Norland	ND	1-1	ND	4-2	0-0	2-1	1-1	0-0	0	ND	2-1	1-3	T-1	T-1	--
<u>Medium to Late</u>															
La. 01-38	ND	1-2	ND	4-2	T-1	4-1	T-1	T-1	0	ND	1-4	4-1	T-1	T-1	--
La. 82-119	ND		ND	3-2	1-3	--	1-1	T-1	0	ND	1-3	3-2	T-0	T-1	2-2
MN 10874	ND		ND	--	1-2	--	T-1	0-0	0	ND	2-3	0-0	--	T-1	--
MN 11373	ND	T-1	ND	4-2	0-0	3-1	T-1	T-1	0	ND	4-1	T-3	2-2	T-1	--
MN 11795	ND		ND	2-2	0-0	2-1	T-1	T-1	0	ND	1-2	0-0	--	T-1	--
NE 9.72-1	ND		ND	3-3	T-1	3-1	1-2	NR	T-4	ND	1-3	1-1	2-2	T-1	--
NE 26.72-2	ND		ND	3-2	1-2	3-1	T-1	NR	0	ND	3-3	4-3	4-3	T-1	2-2
BN 9803	ND	T-1	ND	3-2	T-1	2-1	1-1	NR	0	ND	1-1	3-3	1-2	T-1	--
ND388-1Russ	ND		ND	--	0-0	1-1	T-1	0-0	0	ND	2-3	0-0	T-0	T-1	--
ND534-4Russ	ND		ND	--	T-1	--	T-1	0-0	0	ND	3-3	0-0	T-0	T-1	--
ND860-2	ND	T-1	ND	4-2	1-2	3-1	T-1	0-0	0	ND	1-1	T-1	1-1	T-1	1-3
W 779	ND		ND	--	0-0	1-1	T-1	0-0	0	ND	3-3	0-0	1-1	T-1	--
W 855	ND		ND	--	0-0	1-1	T-1	0-0	0	ND	3-2	T-1	T-0	T-1	--
Red Pontiac	ND		ND	3-2	0-0	3-1	2-1	0-0	1-5	ND	2-1	2-1	T-0	T-1	--
Norchip	ND	T-1	ND	3-3	0-0	2-1	T-1	0-0	0	ND	2-5	T-1	T-0	T-1	--
Russet Burbank	ND		ND	--	0-0	1-1	T-1	0-0	0	ND	1-3	0-0	--	T-1	--
Norgold Russet	ND		ND	2-2	0-0	1-1	T-1	0-0	0	ND	1-3	0-0	T-0	T-1	--

TYPE

- 1 - Small, superficial
 2 - Larger, superficial
 3 - Larger, rough pustules
 4 - Larger pustules, shallow eyes
 5 - Very large pustules, deep holes

1/ AREA

- T = less than 1%
 1 = 1-20%
 2 = 21-40%
 3 = 41-60%
 4 = 61-80%

ND - No Data

North Central Regional Trial Table 7. Summary of Grade Defects - 1984.

Cultivar or Selection	External				Total Free of Ext. Defects	Internal			
	Scab	Growth Cracks	Second Growth	Sun Green		Hollow Heart	Internal Necrosis	Vascular Discolora- tion	Total Free of Int. Defects
Early to <u>Medium Early</u>									
Norland	20.4*	3.5	2.9	2.7	73.9	0.9	1.4	4.4	80.2
<u>Medium to Late</u>									
Ia. 01-38	20.3*	1.1	3.3	3.7	75.4	0.3	0.9	3.4	87.5
Ia. 82-119	22.6*	1.3	4.4	1.9	72.2	0.2	0.8	5.4	85.6
MN 10874	14.2	1.6	7.7*	1.2	78.6	0.3	3.6	6.3	82.7
MN 11373	21.9*	1.3	4.1	7.6	69.4	1.2	5.1*	2.6	85.0
MN 11795	12.5	1.7	7.9*	0.8	80.0	1.4	0.4	3.4	88.1
NE 9.72-1	21.7*	3.1	6.2	13.3*	66.4	0.1	0.4	15.6*	76.3
NE 26.72-2	25.1*	3.8	6.2*	6.2	64.6	1.2	4.0	17.2*	71.2
BN 9803	17.7	2.8	3.6	3.3	77.0	2.8*	1.8	18.7*	71.9
ND388-1Russ	12.7	2.8	4.4	1.4	81.6	2.8*	0.8	3.5	86.6
ND534-4Russ	12.3	0.7	5.1	1.6	83.0	2.6*	0.5	5.6	84.2
ND860-2	16.1	0.9	3.1	3.8	78.9	2.0	3.0	8.8	79.4
W 779	17.9	9.1*	2.9	1.4	74.1	1.7	1.1	6.1	85.1
W 855	9.9	0.2	1.1	2.2	89.3	2.6*	4.6	7.1	79.6
Red Pontiac	21.3*	3.7	5.9*	1.8	71.1	0.6	4.7	4.9	83.8
Norchip	15.6	4.1*	6.4*	6.9*	73.3	0.6	8.3*	8.9	75.8
Russet Burbank	9.9	5.2*	17.4*	1.0	71.9	1.4	1.7	4.5	85.8
Norgold Russet	13.4	2.3	8.9*	1.6	77.6	2.6*	1.1	3.5	85.3

1/ Percent normal tubers showing no defects (some individuals had more than one type of defect).

* Possible weakness of cultivar or clone.

North Central Regional Trial Table 8. Chip Quality - 1984.

Cultivar or Selection	Alb.	2/ Man.	CO ^{1/}	IN ^{1/}	IA ^{3/}	KS ^{3/}	KY ^{2/}	LA ^{2/}	MI ^{1/}	MN ^{3/}	NE ^{1/}	ND ^{2/}	OH ^{2/}	SD ^{3/}	WI ^{1/}
<u>Early to</u>															
<u>Medium Early</u>															
Norland	51	46	3.0	7.0	ND	ND	53	5.9	3.0	ND	5.0	40	50	ND	7.0
<u>Medium to Late</u>															
Ia. 01-38	39	38	2.5	2.0	ND	ND	61	4.2	1.5	ND	3.0	46	55	ND	7.0
Ia. 82-119	47	42	ND	3.0	ND	ND	48	3.2	2.5	ND	4.0	34	55	ND	8.0
MN 10874	38	34	ND	6.0	ND	ND	41	5.3	4.0	ND	6.0	28	35	ND	10.0
MN 11373	26	44	3.5	5.0	ND	ND	51	5.7	3.0	ND	5.0	35	46	ND	8.0
MN 11795	46	63	3.0	5.0	ND	ND	62	2.3	2.0	ND	3.0	45	56	ND	6.0
NE 9.72-1	51	32	2.5	6.0	ND	ND	56	NR	2.5	ND	6.0	34	45	ND	8.0
NE 26.72-2	28	21	3.0	3.0	ND	ND	54	NR	2.5	ND	4.0	26	53	ND	8.0
BN 9803	48	56	2.0	4.0	ND	ND	54	NR	1.5	ND	2.0	39	58	ND	4.0
ND388-1Russ	34	38	ND	7.0	ND	ND	56	3.2	2.0	ND	5.0	44	49	ND	7.0
ND534-4Russ	18	34	ND	6.0	ND	ND	61	4.8	2.0	ND	5.0	38	47	ND	7.0
ND860-2	49	59	1.5	3.0	ND	ND	58	2.6	1.0	ND	3.0	49	53	ND	4.0
W 779	42	54	2.5	4.0	ND	ND	58	2.7	1.5	ND	3.0	45	55	ND	5.0
W 855	31	53	2.5	1.0	ND	ND	61	1.7	1.0	ND	3.0	43	23	ND	3.0
Red Pontiac	22	27	4.0	7.0	ND	ND	41	4.7	4.0	ND	8.0	26	32	ND	10.0
Norchip	43	54	2.0	2.0	ND	ND	56	2.4	1.5	ND	4.0	46	53	ND	4.0
Russet Burbank	21	42	2.0	5.0	ND	ND	42	4.6	2.5	ND	5.0	29	ND	ND	8.0
Norgold Russet	32	38	4.0	8.0	ND	ND	33	5.6	4.0	ND	8.0	23	35	ND	9.0
Average	37	43	2.7	4.7			53	3.9	2.3		4.6	37	47		6.8

1/ PCII Color Chart (1 lightest; 10 darkest)

2/ Agron (Highest number lightest)

3/ No data reported

NR - Not Received

North Central Regional Trial Table 9. Early Blight^{1/} - 1984.

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI	Ave
<u>Early to Medium Early</u>																
Norland	NA	ND	ND	ND	ND	2.8	ND	ND	ND	5.0	1.3	ND	ND	5.0	ND	3.5
<u>Medium to Late</u>																
La. 01-38	NA	ND	ND	ND	ND	3.5	ND	ND	ND	3.0	2.5	ND	ND	5.0	ND	3.5
La. 82-119	NA	ND	ND	ND	ND	3.5	ND	ND	ND	3.0	1.3	ND	ND	5.0	ND	3.2
MN 10874	NA	ND	ND	ND	ND	3.8	ND	ND	ND	3.0	2.8	ND	ND	5.0	ND	3.6
MN 11373	NA	ND	ND	ND	ND	3.0	ND	ND	ND	2.0	1.5	ND	ND	5.0	ND	2.9
MN 11795	NA	ND	ND	ND	ND	2.0	ND	ND	ND	1.0	1.3	ND	ND	5.0	ND	2.3
NE 9.72-1	NA	ND	ND	ND	ND	3.5	ND	ND	ND	2.0	1.3	ND	ND	5.0	ND	3.0
NE 26.72-2	NA	ND	ND	ND	ND	4.8	ND	ND	ND	4.0	2.8	ND	ND	5.0	ND	4.2
BN 9803	NA	ND	ND	ND	ND	2.5	ND	ND	ND	3.0	1.5	ND	ND	5.0	ND	3.0
ND388-1Russ	NA	ND	ND	ND	ND	2.3	ND	ND	ND	2.0	1.3	ND	ND	5.0	ND	2.7
ND534-4Russ	NA	ND	ND	ND	ND	3.3	ND	ND	ND	1.0	1.8	ND	ND	5.0	ND	2.8
ND860-2	NA	ND	ND	ND	ND	3.8	ND	ND	ND	1.0	2.5	ND	ND	5.0	ND	3.1
W 779	NA	ND	ND	ND	ND	4.5	ND	ND	ND	4.0	2.3	ND	ND	5.0	ND	4.0
W 855	NA	ND	ND	ND	ND	4.0	ND	ND	ND	3.0	3.8	ND	ND	5.0	ND	4.0
Red Pontiac	NA	ND	ND	ND	ND	2.8	ND	ND	ND	2.0	2.5	ND	ND	5.3	ND	3.2
Norchip	NA	ND	ND	ND	ND	3.8	ND	ND	ND	2.0	1.8	ND	ND	5.0	ND	3.2
Russet Burbank	NA	ND	ND	ND	ND	5.0	ND	ND	ND	4.0	4.8	ND	ND	5.0	ND	4.7
Norgold Russet	NA	ND	ND	ND	ND	3.5	ND	ND	ND	5.0	1.8	ND	ND	5.0	ND	3.8
Average						3.5				2.8	2.2			5.0		3.4

1/ Early Blight; 1 susceptible; 5 highly resistant; 0 no disease

NA - Not applicable

ND - No data

North Central Regional Trial Table 10. Merit Ratings^{1/} - 1984.

Cultivar or Selection	Alb.	Man.	CO	IN	IA	KS	KY	LA	MI	MN	NE	ND	OH	SD	WI	Total Points
<u>Early to Medium Early</u>																
Norland	3	3		2			1		2							11
<u>Medium to Late</u>																
La. 01-38				4	1	4	3	3	4	3	4		5	4		35
La. 82-119						5	2								3	10
MN 10874										4		4		2		10
MN 11373			1										4			5
MN 11795												2				2
NE 9.72-1	4					3				1						8
NE 26.72-2																0
BN 9803	5															6
ND388-1Russ		2		5				4	1	2	3	3	3	3	1	27
ND534-4Russ	1				5	2	5		3	5		5	2	1	5	34
ND860-2		1			4	1	4	5								15
W 779	2	5			3			1	5		2				4	22
W 855				3				2			5		1		2	13
Red Pontiac		4			2											6
Norchip												1				1
Russet Burbank														5		5
Norgold Russet																0

1/ Merit Ratings

Rating	Points
1	5
2	4
3	3
4	2
5	1

CALIFORNIA

R. F. Voss and C. W. Dennett

In 1984, first year single-hill, 5-hill, 12-hill, 2 replications of 20-hill, and 4 replications of 27-hill trials were conducted at two locations - Kern County and Tulelake Basin. In addition, replicated trials were conducted at a second Kern County location (in conjunction with the Western Regional Trial), in Riverside County and in the Santa Maria Valley. Non-replicated trials were observed in 22 commercial fields throughout the state.

Seedling Selection

First year seedlings (22,443) from Idaho (J. Pavsek), North Dakota (R. Johansen), and Colorado (D. Holm) were grown. Of these 12,599 from 122 families were grown in Kern County, and 9,844 from 107 families at Tulelake. In Kern County, 318 were selected (57 russets, 187 whites or buffs, and 71 reds) from 90 families. This was a 2.5 percent selection rate of seedlings and 74 percent selection rate of families. At Tulelake, 293 seedlings (165 russets, 86 whites or buffs, and 42 reds) from 81 families were selected. These represented 3.0 percent and 76 percent selection rates of seedlings and families, respectively. Of the 107 families planted, at both locations, 62 had selections made at both locations, 17 had selections at only Kern County, 19 had selections only at Tulelake, and nine had no selections. Fifteen families were planted only in Kern County. The selection percentages of 11,164 seedlings from Idaho were 2.8 percent and 3.5 percent in Kern County and Tulelake, respectively; of 10,036 seedlings from North Dakota were 2.3 percent and 2.7 percent; and of 1,242 seedlings from Colorado were 0.5 percent and 1.1 percent. Parents with the greatest number of progeny were Lemhi, WD641-10, A7637-8, Wn245-2, ND534-4, and Butte for russets; WC521-12, ND9583-1, WC672-2, and NDD277-2 for chippers and long whites; and Redsen, Bison and ND9403-16R for reds. Of the 122 families planted, approximately 74 had one or both parents that were either selected in California or had performed well in California and had specifically identified highly desirable traits. These included Lemhi, AD74548-5, WD641-10, NDD47-1, WC521-12, Atlantic, AD7267-1, TND14-1, NDD277-2, Bison, Redsen, ND9403-16R, Kennebec, Sangre, BC8370-4, WC672-2, WC316-1, Nooksack, WC325-1, Targhee, ND6993-13 (Minnesota Russet), ND534-4, and ND860-2; all had some progeny selected.

Second-year seedling entries from seven sources numbered 731 (227 in Kern County and 504 at Tulelake). Selection percentages were 12 percent and 17 percent, respectively. Seedlings originating from Idaho selected at a 10 percent and 18 percent rates in Kern and Tulelake, respectively; from Colorado seven percent and 47 percent; and from North Dakota

14 percent and 21 percent, respectively. Of the 113 selections, 72 were russets, 32 were whites/buffs, and 9 were reds; 28 were selected in Kern County, and 85 at Tulalake.

Approximately 200 entries were grown in 5-hill plots in Kern County as a part of a heat tolerance program in California. (I. Buddenhagen). These had been previously selected from a summer grown location near Davis. Of these 200 (4 were russets, 77 whites/buffs), 81 were selected for further evaluation.

Third year seedling entries from seven sources numbered 273 (135 in Kern County and 138 at Tulalake). Selection percentages were 26 percent and 36 percent, respectively. Seedlings originating from Idaho were selected at 45 percent and 29 percent, at Kern and Tulalake, respectively, and from North Dakota, 27 percent and 32 percent, respectively. Of the 88 selections, 52 were russets, 32 were whites/buffs, and 6 were reds; 36 were selected in Kern County and 52 at Tulalake.

Fourth year evaluations, accomplished in two replicates of 20 hill plots, included 24 California selections (7 russets, 12 chippers, 3 long whites and 2 reds), 27 selections from other states (15 russets, 7 chippers, 2 long whites, and 3 reds), and 7 named varieties in Kern County; and 26 California selections (22 russets, 4 chippers), 12 selections from other states (10 russets, 1 chipper, and 1 red), and five named varieties. The top russet performers were A75188-3, AD7818-4, and TC2-1 in Kern County and NDD837-2, AD79200-5, and A7735-1 at Tulalake. Top chipping lines were Rosa, AD79491-1, AD79249-8, NDD1338-7, and AD79249-6 in Kern County and AD79491-5, A79491-1, and NDD852-2 at Tulalake. Top long whites were AD79240-2 and A78100-4. Top red selections were AND79537-3R, AD79537-3R, and NDTX8731-1R.

The advanced yield trials included 78 entries (49 russets, 16 chippers, 8 long whites, and 5 reds) in total, which included virus free as well as non-virus free seed sources of four advanced selections. An average of 100 cwt/A more total yield resulted from the virus free seed. At Kern County location No. 1, 60 entries included 37 russets, 12 chippers, 7 long whites, and 4 reds. At Kern County location No. 2, a total of 46 entries were evaluated (29 russets, 9 chippers, 5 long whites and 3 reds). At Tulalake, the 60 entries included 39 russets, 9 chippers, 8 long whites, and 4 reds. In Riverside County, 16 entries included 6 russets, 3 chippers, 3 long whites and 4 reds. At Santa Maria, 16 entries included 9 russets, 6 chippers and 1 long white. No. 1 yields at the two Kern County locations were 310 and 375 cwt/A, respectively, at Tulalake 255 cwt/A, in Riverside County 375 cwt/A, and at Santa Maria 460 cwt/A. Russets which consistently performed well in all trials included AD7377-1, A74133-1, AD7267-1, and A74212-1. Chippers with top performance were AD77187-7, AD77187-12, and NDD277-2. Top long whites were NDD47-1,

UCR1-18, and AD74548-5. New Norland performed well as a new red.

Advanced Selection
and Cultivar
Evaluation

Ten advanced selections were considered at the beginning of 1984, to be candidates for release as named varieties. These and other advanced selections and standard varieties were evaluated in replicated yield trials and commercial field plantings. Several were tested through commercial sales channels, directly from the field and after storage. The following is the status of the most advanced lines:

AD7377-1 is being recommended for official release and naming. It is a medium/heavy russet with wide production adaptability. It is suitable for fresh market only and medium length storage.

NDD47-1 is being recommended for official release and naming. It has long blocky white tubers. Yield potential is lower than White Rose, but present No. 1's and market shelf life are much higher. It stores excellently for long periods.

AD7267-1 is being recommended for official release and naming. It has light russet skinned tubers, which is a marketing deficiency in Centennial Russet growing areas but a good, high yielding, fresh market alternative to Norgold Russet. It has medium storage length.

WC285-18 is being recommended for official release and naming. This heavy/coarse russet is a sibling of Centennial and produces well in very light sandy soils. Yields are comparable to Centennial, disease resistance and vigor generally better, and storage life longer.

BC8370-4 is not being recommended for release. It is a heavy attractive russet but has severe hollow heart potential and frequent low yields. It is being grown commercially, however.

WD641-10 is not being recommended for release. It has golden russet tubers of high fresh market and processing qualities. Yields have been generally unsatisfactory however. Many characteristics resemble Nooksack.

AD7267-3 is not being recommended for release. It has performed well in northern but not southern California. It has medium russet tubers suitable for fresh market and medium storage. Further commercial testing will be conducted.

A74133-1 is not being recommended for release, but has received broad commercial interest. It has light, variable shaped russet tubers suitable for fresh market and long storage.

AD7386-1 is not being recommended for release, although some commercial acreage is being grown. It has long oval white

tubers that sometimes tend toward banana shape. Yield potential is only medium.

NDD277-2 is not being recommended for release because of variable chipping quality. It has round oval white tubers of medium specific gravity. Vine vigor is excellent as a yield potential.

ND258-2 is being considered for release. Yield potential is medium but chipping quality has been good.

Seed Increase
Program

Virus free clones of thirty advanced selections have been produced, but very small quantities of seed tubers are available.

Columbia root knot nematode (M. chitwoodii) was found in a few lots in our seed increase block of non-virus free material at Tulalake. Thus, none of the tubers grown in this block will be available for testing or distribution in 1985. An accelerated meristeming program and rapid increase techniques (stem cutting, microtubers) and microtubers will be implemented in 1985 to help alleviate the delay in the variety development program created by this nematode infestation.

1984 POTATO VARIETY TRIALS
 REPLICATED YIELD TRIAL
 KERN COUNTY 1
 RANKED BY TOTAL NO. 1'S

YIELD, CWT/AC

VARIETY	TOTAL	NO. 1'S				2'S& CULL	B'S	% NO.1'S	SP. GRAV.	1	2	3
		TOTAL	>100Z	4-100Z	TUBER RTNG.					VINE RTNG.	BLK SPOT	
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
RUSSETS												
AD74393-3	490	460	15	445	0	25	94	85	3.1	4.0	0.6	
A74133-1	435	410	20	385	10	15	94	85	3.2	3.5	0.4	
AD7377-1(F)	425	410	65	340	10	10	95	78	4.0	3.6	0.3	
AD7858-4	420	400	25	375	0	15	95	86	3.8	3.8	1.3	
AD74135-1	425	390	20	370	5	30	91	86	3.5	3.4	0.8	
AD7267-1(F)	405	380	10	365	0	25	93	80	4.0	3.8	0.9	
NDD440-9	430	370	25	350	35	20	86	86	2.8	4.5	1.2	
AD7377-1	355	330	20	315	10	10	92	80	3.8	3.4	0.2	
A74212-1	345	325	10	315	0	20	94	83	3.2	3.4	0.1	
AD7430-2	360	325	5	320	0	35	90	86	3.3	3.2	0.3	
AD7818-5	350	325	25	300	15	10	92	89	3.8	4.8	0.6	
NDD666-2	350	325	5	320	5	20	92	82	3.7	3.5	1.2	
A69870-10	345	310	30	275	10	25	89	80	3.1	3.2	1.8	
CENTENNIAL	325	310	30	280	5	10	94	88	3.5	3.6	0.2	
TND329-1	320	305	40	265	5	10	94	72	4.5	4.0	0.3	
AD77658-2	320	295	10	290	0	25	92	93	3.8	3.4	1.3	
A68599-1	315	285	5	280	5	25	90	89	3.1	3.5	0.7	
NDD840-1	360	280	0	280	0	80	80	86	3.4	3.1	0.3	
NDD1099-3	310	275	0	275	15	15	89	---	2.5	3.7	---	
WC285-18	300	275	30	250	5	20	92	82	4.1	3.0	0.4	
NDD392-9	290	260	10	250	15	15	90	75	3.1	3.4	0.1	
AD78100-6	280	250	0	250	10	25	88	89	3.0	3.1	2.7	
AND7430-1	285	250	15	235	0	30	86	86	3.3	3.2	1.8	
NORGOLD	265	250	5	245	5	15	93	82	3.1	2.6	0.3	
R. BURBANK	290	250	0	250	20	20	84	88	2.8	3.8	0.7	
AD7267-1	290	245	5	245	5	40	83	78	3.4	3.6	0.6	
AND74344-1	270	240	5	240	5	25	88	84	2.8	3.6	0.6	
BC8370-4	265	240	10	230	10	15	91	86	2.9	3.0	0.3	
A74541-1	275	230	5	225	0	45	82	94	2.7	4.2	1.2	
NDD1099-2	260	230	5	225	5	25	87	89	3.1	3.6	0.8	
ND534-4	255	225	5	220	0	30	87	87	3.1	3.1	0.2	
A71908-4	260	215	0	215	10	40	80	86	3.1	3.3	0.7	
NDD443-4	255	215	10	205	35	5	84	77	2.6	3.1	0.7	
ND967-1	190	175	0	175	0	15	91	77	3.0	3.2	1.2	
ND941-2	170	160	0	160	0	10	92	84	2.4	3.2	0.8	
AD7267-3	180	150	0	150	0	30	81	90	2.8	3.4	1.0	

YIELD, CWT/AC											
=====											
VARIETY	TOTAL	NO. 1'S						SP. GRAV.	1 2 3		
		TOTAL	>100Z.	4-100Z	2'S& CULL	B'S	% NO.1'S		TUBER RTNG.	VINE RTNG.	BLK SPOT
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
CHIPPERS											
AD77526-4	435	415	65	350	5	15	95	86	4.1	4.0	0.8
KENNEBEC	425	415	70	345	0	5	97	84	4.1	4.0	0.2
AD77187-12	430	400	15	385	5	25	93	93	3.5	4.7	1.6
ATLANTIC	380	370	40	330	5	10	96	99	3.8	4.0	0.4
BC9020-7	395	370	15	355	10	10	94	84	3.5	4.5	0.4
NDD277-2	385	360	0	360	15	5	94	85	3.9	3.5	0.3
ND258-1	375	350	40	310	10	15	94	84	3.9	3.6	1.3
AD77187-7	365	345	20	325	5	20	94	88	4.0	3.4	0.8
NDD852-2	365	335	5	330	10	20	91	79	2.6	3.5	0.9
BELCHIP	330	315	20	290	10	5	94	91	3.5	3.6	0.2
ND89-9	320	305	0	305	0	15	94	83	3.1	3.2	0.3
SHEPODY	310	285	35	250	15	10	92	90	3.7	3.1	0.5
ND971-5	205	165	0	165	0	35	80	85	2.0	2.8	0.5
LONG WHITES											
W.ROSE	430	395	65	335	30	5	92	76	3.1	3.6	0.0
UCR4-2	425	385	95	295	30	10	90	82	2.9	4.9	0.6
UCR1-18	405	350	25	325	40	15	86	78	3.4	3.9	0.3
AD74548-5(F)	410	340	20	320	25	40	82	87	3.6	4.8	0.6
NDD47-1	295	290	60	230	0	5	96	89	4.2	2.4	0.2
AD74548-5	340	285	0	285	5	50	83	86	3.4	3.8	1.9
AD7386-1	240	195	5	195	10	35	79	79	3.4	3.4	0.0
REDS											
RED LA SODA	450	445	5	440	0	5	98	73	3.4	3.8	0.3
CHIEFTAIN	405	395	30	365	0	10	96	80	4.0	4.0	0.6
NEW NORLAND	350	340	10	330	0	5	98	79	3.9	3.2	0.4
SANGRE	290	265	0	260	0	25	90	80	3.0	2.8	0.4

MEAN	337	308	18.4	209	8		90				
LSD.05	81	78	28	68	16.7		2				

- 1) 1= LOW, 5= HIGH, 3= MINIMUM ACCEPTABLE RATING
2) 1= VERY POOR, 2= POOR, 3= FAIR, 4= VERY GOOD, 5= EXCELLENT
3) 0= NONE, 5= VERY SEVERE

1984 POTATO VARIETY TRIALS
TULELAKE REPLICATED YIELD TRIAL
RANKED BY TOTAL NO. 1'S

YIELD, CWT/AC										
=====										
VARIETY	TOTAL	NO. 1'S			2'S & CULL	B'S	% NO. 1'S	SP. GRAV.	1	2
		TOTAL	>10 OZ	4-10 OZ					TUBER RTNG.	VINE RTNG.
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
RUSSETS										
A74212-1	545	470	260	205	60	20	85	82	3.6	3.1
A69870-10	525	465	140	330	35	25	88	86	3.5	3.4
A7411-2	470	365	115	245	60	45	77	94	3.9	3.6
AD7377-1(H)	415	355	155	200	40	25	84	72	3.8	3.4
A74123-7	445	325	125	200	100	20	76	80	3.2	3.4
AD7377-1	390	325	155	170	50	20	85	72	3.6	3.5
R. BURBANK	455	325	90	235	80	55	70	95	3.4	4.1
A75188-3	455	320	135	185	110	20	70	80	2.8	3.6
AD7267-3	370	310	85	225	35	30	82	84	3.7	3.9
AD74135-1	400	305	155	150	80	15	75	74	3.2	3.0
LEMHI	370	305	120	185	40	25	82	90	3.9	3.8
AD7267-1(H)	390	295	130	160	60	35	74	78	3.5	3.6
NDD840-1	390	285	55	230	25	85	72	82	3.7	2.9
TC2-1	355	270	95	175	65	20	77	92	3.8	3.4
A71908-4	335	265	85	180	40	35	78	84	3.3	3.0
AND74344-1	315	265	125	140	40	5	83	81	3.2	3.4
BUTTE	365	265	90	175	50	45	72	86	3.6	3.5
AD77658-2	310	260	140	125	30	20	85	80	4.0	3.5
AD7818-5	375	260	95	165	80	35	69	94	3.7	3.7
AD74393-3	315	255	35	220	35	25	80	75	3.5	3.5
A68599-1	285	240	100	140	30	15	85	84	3.4	3.2
NORGOLD	385	240	100	140	130	15	62	76	2.9	3.4
A66122-3	315	210	115	95	90	15	66	81	2.9	2.9
AD7267-1	275	205	120	85	55	15	73	74	3.8	3.0
AD7430-2	290	200	60	135	50	45	67	85	3.6	2.9
TND329-1	275	200	65	135	40	30	74	64	3.5	3.2
WC285-18	270	195	60	135	50	25	72	84	2.9	2.4
CENTENNIAL	245	190	40	150	35	25	75	82	3.1	2.9
NOOKSACK	220	175	75	100	35	10	78	84	3.5	3.2
LC-1	210	170	25	140	10	30	82	80	3.7	3.0
A74133-1	235	165	85	85	60	10	68	82	3.4	2.1
AND7430-1	220	150	25	120	15	55	68	80	3.6	3.0
A74114-4	170	135	35	100	20	15	78	85	3.2	3.0
ND534-4	180	135	35	95	20	30	72	76	4.1	3.1
NDD666-2	185	125	25	100	20	40	69	76	3.4	2.6
NDD392-9	295	105	60	50	155	35	36	76	1.2	3.0
AC77652-1	160	100	15	85	40	25	62	78	3.1	2.6
ND967-1	125	80	30	50	25	20	63	76	2.8	3.1

YIELD, CWT/AC										
=====										
VARIETY	TOTAL	NO.1'S			2'S& CULL	B'S	%	SP. GRAV.	1	2
		TOTAL	>10 OZ	4-10 OZ					TUBER RTNG.	VINE RTNG.
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
CHIPPERS										
AD77187-12	535	450	125	330	60	25	84	94	4.1	3.7
AD77187-7	435	390	80	310	25	20	89	89	3.8	3.0
KENNEBEC	545	355	180	175	180	10	66	84	3.3	4.5
AD77526-4	365	275	125	155	75	15	76	87	3.0	3.8
ND258-1	325	275	130	145	35	10	86	84	3.9	3.3
ND971-5	305	270	105	165	20	15	87	89	4.0	3.1
SHEPODY	360	220	115	105	125	15	59	86	2.9	3.6
NDD828-7	285	195	45	155	75	15	69	82	3.5	3.1
ND406-2	265	190	75	115	60	15	69	82	3.3	3.3
NDD277-2	230	190	100	90	30	10	83	87	3.8	3.8
LONG WHITES										
WHITE ROSE	525	360	195	165	140	20	69	81	2.3	4.3
NDD47-1(F)	395	340	165	175	35	20	85	78	4.1	3.0
UCR1-18	420	315	115	200	75	30	76	70	3.0	3.9
UCR4-2	430	265	30	240	85	75	61	82	2.5	3.9
AD74548-5(H)	300	235	40	195	40	30	78	88	3.4	3.8
AD74548-5	260	175	50	130	45	40	67	86	3.4	3.3
NDD47-1	325	275	130	145	35	15	85	80	4.0	3.4
AD7386-1	50	25	10	15	20	5	34	85	2.0	1.7
REDS										
CHIEFTAIN	385	350	115	235	30	5	90	78	3.8	3.5
RED LA SODA	565	350	200	150	200	15	62	78	2.1	3.6
REDSSEN	330	295	40	255	10	25	89	76	4.1	3.2
SANGRE	220	190	30	165	10	20	87	70	4.2	3.0

MEAN	337	255	94	160	57	25	74			
LSD.05	118	97	56	62	49	15	12.3			

- 1) 1= LOW, 5= HIGH, 3= MINIMUM ACCEPTABLE VISUAL RATING
2) 1= VERY POOR, 2= POOR, 3= FAIR, 4= VERY GOOD, 5= EXCELLENT

COLORADO

D. G. Holm, M. Workman, and M. K. Thornton

Breeding Program

Characteristics being emphasized in the Colorado program are yield, specific gravity, russeting, and fresh market/processing qualities. Thirty parental clones were selected for crossing in 1984. Seeds from 308 combinations were obtained. Sixty-one seedling families were grown in the greenhouse, producing 12,632 tubers for initial selection in 1985. Surplus tubers were distributed to Idaho, Oregon, and Minnesota.

Seedling tubers were obtained from Dr. R. E. Webb, Beltsville, Maryland, Dr. J. J. Pavek, Aberdeen, Idaho, Dr. R. E. Voss, Davis, California, and Dr. J. Creighton Miller, Jr., Lubbock, Texas. The California seedlings were produced from true seed obtained from Colorado.

Selection Program

A total of 43,700 first-year seedlings were planted, with 585 being selected for further observation. Another 686 clones were in various stages of preliminary testing. One hundred forty-nine of these clones were saved for further evaluation. Eleven advanced selections were tested and nine were saved for increase and continued evaluation. Another 91 potato clones are being maintained for breeding or other experimental purposes.

Cultural and environmental data for yield trials are summarized in Table 1.

Advanced Yield Trial. Sixteen entries, 11 advanced selections and five cultivars, were planted in the advanced yield trial. Data collected on yield, grade, specific gravity, stand, vine maturity, tuber shape, and skin type are presented in Table 2. Russet selections showing promise and meriting further testing are: A72685-2, AC77149-2, AC77513-1, AD74135-1, BC9668-1, WNC285-18 and WNC567-1. Selection AC77513-1 will be entered in the WRCC-27 trials in 1985. Data are being summarized to name and release WNC285-18 in 1985.

Chipping and Processing Studies. Sixty-eight clones in our program were evaluated for chipping potential in the fall (October 9) by Clover Club Foods Company. Clones with acceptable color in the fall were retested on January 16 after being stored at 50° F. Data for the clones which were chipped on both dates are presented in Table 3.

Another chipping study was conducted at the San Luis Valley Research Center. Eight selections and two standard cultivars were tested at harvest and after various storage regimes. Specific gravity was determined at harvest. This data is summarized in Table 4. None of these clones chipped satisfactorily

directly out of 40° F storage or with reconditioning at 70° F for two weeks. Atlantic, Norchip, A70369-2, BR7093-24, and TXA17-1 produced acceptable chips under most other storage regimes, however.

Grower Tests. Two russet selections, TC582-1 and WNC567-1, will be released for seed increase and evaluation in 1985. Both of these clones have generally performed better than Centennial Russet and Russet Burbank. See Table 5.

Sangre Selection Studies. Seventeen line selections of Sangre were made from our tuber-unit seed lot in 1982. Seven selections were made for typical vine and 10 for larger vines. Progeny rows of each selection were grown for observational purposes in 1983. In 1984 a comparative performance trial was conducted. Data were collected on yield, grade, stand, vigor, plant height, and vine maturity. Results of this study are presented in Table 6. Clones differed considerably for the characteristics observed.

Colorado Table 1. Cultural and environmental data for yield trials, San Luis Valley Research Center, Center, Colorado, 1984.

- CULTURAL DATA -					
Soil Type	- Sandy Loam				
Fertilizer	- Nitrogen, phosphorus, potassium banded at planting at 120, 65 and 37 pounds per acre, respectively				
Planting Date	- May 16				
Vines Killed	- Rotobeat September 7				
Harvest Date	- September 19				
Irrigation	- 12.1 inches applied by center pivot sprinkler				
Weed Control	- Cultivated on June 6				
	- Lasso applied at the rate of 2.5 pounds active ingredient per acre on June 6				
Insecticides	- Disyston applied at the rate of 1 pound active ingredient per acre on July 21 and August 8.				
- ENVIRONMENTAL DATA -					
	MONTH				
	May	June	July	August	September
Rainfall (Inches)	0.21	0.43	0.74	1.20	0.56
Temperature (° F)					
Average Maximum	71.7	74.8	80.0	78.3	73.1
Average Minimum	37.3	40.0	47.2	45.8	37.9

CO Table 2. Yield, grade, specific gravity, stand, vine maturity, tuber shape and skin type for advanced yield trial clones.

Clone	U.S.No.1				U.S.No.2				Specific Gravity	Stand %	Vine Maturity 1/	Tuber Shape 2/ & Skin Type
	Total Yield		U.S.No.1		U.S.No.1		<4 oz. Yield					
	Yield	Cwt/A	Yield	%	Yield	%	Yield	Cwt/A				
A70369-2	381	251	65.3	12	124	6	1.099	100	2.0	Ob-Ov, W		
A72685-2	404	312	77.5	42	87	5	1.095	99	3.0	Ob, R		
AC77149-2	301	235	78.2	24	62	4	1.084	97	2.3	Ob, R		
AC77513-1	349	261	74.8	26	75	13	1.099	96	3.8	Ob-L, R		
AC77514-1	380	312	82.1	30	50	18	1.097	99	3.0	Ob-L, R		
AD74135-1	449	355	78.9	49	71	23	1.095	100	3.3	Ob-L, R		
BC9668-1	340	269	79.0	31	62	10	1.082	98	2.0	Ob, R		
BR7093-24	411	356	86.6	79	50	5	1.099	91	3.8	R, W		
TXA17-1	372	288	77.3	24	61	22	1.091	98	3.3	R, W		
WNC285-18	313	241	77.0	22	67	6	1.098	100	3.8	Ob, R		
WNC567-1	375	302	80.7	45	64	9	1.089	96	2.3	Ob-L, R		
Centennial Russet	297	220	74.0	16	68	10	1.086	97	2.8	Ob-Ov, R		
Nooksack	248	211	85.3	49	16	21	1.106	98	4.3	Ob, R		
Norchip	356	274	77.2	19	71	10	1.089	98	1.5	R, W		
Russette	319	255	80.0	10	57	7	1.102	99	2.5	Ob, R		
Russet Burbank	387	283	72.5	42	88	16	1.089	99	2.0	L, R		
Mean	355	277	77.9	32	67	11	1.094	98	2.8			
ISD(0.05)	44	48	7.5	23	22	12	-	4	0.6			

^{1/} Vine maturity is based on the amount of dead foliage on August 27: 1 = Very Early; 2 = Early; 3 = Medium; 4 = Late; 5 = Very Late.

^{2/} Tuber Shape: R = Round; Ov = Oval; Ob = Oblong; L = Long
Skin Type: R = Russet; W = White

Colorado Table 3. Chip color evaluations conducted by Clover Club Foods Company.^{1/}

Clone	Chip Color ^{2/}	
	October 9 ^{3/}	January 16 ^{3/}
CO81103-5	2.0	2.0
AC80545-1	2.0	2.5
BR7093-24	2.5	2.5
Norchip	3.0	2.0
CO81103-1	3.0	2.5
TXA17-1	3.0	2.5
B5141-6	3.0	2.5
A70369-2	2.5	3.0
Atlantic	3.0	2.5
CO81103-2	3.0	2.5
WNC672-2	3.0	3.0
CO7918-15	2.5	3.5
CO8128-1	4.0	2.5
CO8014-2	3.5	4.0
AC80100-1	4.0	3.5
CO81104-3	3.5	4.5
CO8073-7	4.0	4.5
CO8107-2	4.0	4.5
AC80568-3	4.5	4.5
CO81117-1	4.0	5.0
CO80211-1	4.5	5.5
AC80561-2	4.0	6.0
CO8073-6	3.0	7.0
CO7917-11	4.5	6.0
AC81218-5	4.5	6.0
AC81218-3	3.5	7.0
CO8073-3	4.0	7.0

^{1/} Data collected by Larry Anderson

^{2/} Color was rated using the PCII 1-10 Scale. Ratings of 1-4 acceptable, 5 marginal.

^{3/} Potatoes harvested September 3-5 and held at approximately 70° F until October 9; then stored at approximately 50° F until January 16.

Colorado Table 4. Color^{1/} of chipping study entries.

Clone	At Harvest	Color					Specific Gravity
		3 wks @ 70°F	10 wks @ 40°F	10 wks @ 50°F	2 wks/70°F		
					10 wks/40°F	10 wks/50°F	
Color							
A70369-2	2.0	2.0	5.0	2.5	4.0	1.0	1.094
AC80533-2	3.5	1.5	5.0	3.0	4.5	3.5	1.082
BC9955-1	2.5	1.0	5.0	3.0	4.5	3.0	1.096
BR7093-24	2.0	1.5	5.0	3.0	4.0	2.5	1.084
CO7920-3	2.5	2.5	5.0	3.0	5.0	3.0	1.094
TXA17-1	2.0	1.5	5.0	2.0	4.5	1.5	1.082
WNC521-12	2.0	2.0	5.0	3.5	4.0	4.0	1.092
WNC672-2	1.0	1.5	5.0	3.0	3.0	3.5	1.085
Atlantic	1.5	2.5	5.0	2.0	3.0	2.0	1.103
Norchip	2.5	2.0	5.0	2.5	4.0	1.0	1.090

^{1/} Chip color was rated using the Potato Chip/Snack Food Association 1-5 scale. Ratings of 2.0 or less acceptable.

Colorado Table 5. Comparison of the numbered selections TC582-1 and WNC567-1 with Centennial Russet and Russet Burbank for yield and grade. Data is averaged for 1983 and 1984.

Clone	U. S. No. 1		U. S.		External		Hollow	
	Total Yield	Yield	No. 1	%	Defects	%	Heart	%
TC582-1	392	286	73.0		2.0		0.8	
WNC567-1	371	292	78.8		4.0		-	
Centennial Russet	345	273	79.0		1.9		1.0	
Russet Burbank	378	251	66.4		9.2		0.5	

1/ Includes defects such as growth cracks, second growth, misshapen, and alligator hide.

2/ Based on tubers greater than 10 ounces.

Colorado Table 6. Yield, grade, stand, vigor, plant height, and vine maturity of 18 Sangre clones.

Clone	U.S.No.1												Plant Height - cm -	Vine Maturity	
	Total Yield	U.S.No.1 Yield	U.S.No.1		Yield <4 oz	U.S.No.2 Yield	Cull Yield	Stand %	Vigor Rating	Plant Height	Vine Maturity				
			Yield	%								Yield			Cwt/A
1	394	325	82.4	42	68	1	0	98	3.8	54	1.5				
2	390	324	83.0	51	62	5	0	98	3.0	56	1.5				
3	386	331	85.4	43	50	4	2	98	2.8	56	2.3				
4	414	345	83.3	62	67	1	1	99	2.8	58	1.8				
5	407	358	87.9	100	45	3	1	99	3.0	56	1.8				
6	394	319	81.1	78	46	19	9	100	2.3	85	4.8				
7	432	366	84.7	95	53	12	1	100	2.5	76	4.5				
8	439	371	84.4	82	54	11	2	100	2.3	69	3.5				
9	353	274	77.7	69	60	13	6	93	1.8	79	4.3				
10	458	401	87.5	120	47	8	2	98	3.3	67	3.5				
11	482	404	83.7	116	65	3	10	99	3.0	69	3.8				
12	407	360	88.2	92	41	6	0	98	2.8	68	3.3				
13	398	318	79.7	65	74	5	1	99	2.0	80	4.8				
14	465	409	88.0	130	44	10	2	97	2.8	68	3.3				
15	424	356	84.1	82	60	8	0	99	3.0	64	3.0				
16	395	338	85.5	55	54	3	1	100	3.0	53	1.3				
17	442	362	81.9	40	74	5	2	100	3.8	56	1.8				
18	435	386	88.7	132	39	8	2	100	3.8	56	1.8				
Mean	417	353	84.3	81	56	7	2	99	2.8	65	2.9				
LSD(0.05)	44	49	4.6	38	16	8	NS	2	0.9	4	0.8				

1/ 1 = Least vigor; 5 = most vigor

2/ Vine maturity is based on the amount of leaf foliage on August 27: 1 = Very Early; 2 = Early; 3 = Medium; 4 = Late; 5 = Very Late

3/ Clone 18 is the standard Sangre produced at the San Luis Valley Research Center

4/ Not Significant

FLORIDA

J. R. Shumaker, D. P. Weingartner, J. Watts, and R. E. Webb

Variety and Seedling Trials

Methods. Potato varieties and seedlings were tested for their adaptability and desirable horticultural characteristics at the Agricultural Research and Education Center, Hastings, Florida. Clones were grown in advanced trials (four replications). Telone® (6 gpa preplant) and Temik® (3 lb ai/A in-the-row at planting) were applied to all trials. Seed was spaced 12 inches apart in 20 foot single row plots. Between row spacing was 40 inches. The crop was planted on February 3 and 8 and harvested May 21-23. Commercial cultural practices were used in all tests. Yield of tubers, their appearance and specific gravity were taken at harvest. Tuber samples were shipped to Berwick, Pennsylvania, for chip color evaluations. The tests were grown under favorable conditions.

Round White Adaptability and Processing Quality Trials. In two trials replicated four times Atlantic (standard chip processing cultivar) and WF31-4 and WF46-4 (USDA selections from Atlantic) produced the best tuber yields and processing traits. Denali produced tuber yields and total solids equal to those associated with Atlantic, however, the color of its chip was considered fair to borderline for acceptable processing (Tables 1-2). La Chipper, standard cultivar grown for early table market, and Ontario produced the highest tuber yield in these tests. While they are not acceptable for chip processing, both demonstrated excellent fresh market traits. Ontario will be grower evaluated in 1985.

Long Russet Adaptability Trials. Centennial, standard russet-skin cultivar, Russette, Norgold 40 and B9648-9 produced some of the higher tuber yields when grown in replicated trials. They also produced acceptable uniform tuber types. Centennial, Russette and B9648-9 tubers were considered oblong to long in shape while those produced by Norgold were scored round to oblong. Russette and B9540-62, a candidate for release in 1985 which produces highly desirable long tubers, will be grower evaluated next year (Table 3).

Florida Table 1. Results from several clones selected for advanced testing at Hastings, Florida -- 1984.

Cultivar	Yield (cwt/A)		Tuber Appear- ance ^{1/}	Specific Gravity	Chip Color ^{2/} Weeks after harvest			Average
	US 1A	Total			1	2	3	
La Chipper	296	313	5.0	1.071	3	4	5	4.0
AT24-9	294	309	7.8	1.070	5	5	6	5.3
NY 72	268	292	7.3	1.072	3	2	2	2.3
CF 7523-1	261	285	7.8	1.069	5	7	8	6.7
Pungo	258	276	5.0	1.069	6	6	5	5.7
Atlantic	243	267	5.8	1.083	3	3	5	3.7
CF 7353-1	238	251	5.0	1.071	3	3	5	3.7
Denali	233	256	6.8	1.085	3	5	6	4.7
Yankee Supreme	230	245	7.0	1.077	5	4	2	3.7
Late Wischip#19	230	254	6.0	1.072	2	2	2	2.0
AF 330-1	222	235	6.3	1.070	5	5	6	5.3
BN 9815-3	221	251	4.8	1.081	3	5	5	4.3
G 670-11	221	236	5.3	1.087	6	5	6	5.7
702-80	216	228	7.3	1.075	1	2	3	2.0
Belchip	214	226	5.8	1.073	2	2	3	2.3
Penn 71	214	232	5.3	1.076	2	1	2	1.7
U 729-21	196	221	7.0	1.067	2	3	3	2.7
NY 71	191	208	6.0	1.071	3	2	2	2.3
Sebago	186	212	6.8	1.074	3	4	5	4.0
700-83	184	201	7.5	1.070	2	4	4	3.3
New Norchip	182	214	5.0	1.081	2	3	3	2.7
Wischip #16	179	208	5.8	1.076	1	1	4	2.0
Superior	176	193	6.3	1.072	5	3	3	3.7
New Superior	173	185	6.8	1.075	3	2	3	2.7
702-91	171	199	3.5	1.074	3	3	3	3.0
ND 860-2	168	193	5.3	1.079	2	2	2	2.0
Yankee Clipper	168	200	7.8	1.075	3	3	3	3.0
CF 77154-10	167	190	7.0	1.076	1	2	1	1.3
BN 9803-1	167	195	5.0	1.074	3	1	5	3.0
716-15	164	179	4.8	1.076	3	2	2	2.3
BR 7088-18	161	186	4.5	1.080	3	2	2	2.3
U 715-94A	160	177	6.8	1.083	2	1	2	1.7
WTS #7	159	186	5.0	1.070	2	2	2	2.0
704-10	157	174	5.5	1.076	3	6	5	4.7
CS 7232-4	156	170	6.5	1.070	2	1	1	1.3
Islander	148	177	6.5	1.071	1	3	2	2.0
Norchip	135	165	4.5	1.078	2	2	2	2.0
U 715-64	134	165	7.5	1.078	3	2	3	2.7
WTS #5	61	102	6.5	1.082	1	1	3	2.3
LSD (0.05)	45	43	1.4	1.005	-	-	-	-
(0.01)	60	57	1.8	1.007	-	-	-	-

1/ From 10.0 - most desirable to 0.0 = completely undesirable.

2/ Chip Color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use

Florida Table 2. Results from several clones selected for advanced testing at Hastings, Florida -- 1984.

Cultivar	Yield (cwt/A)		Tuber Appearance ^{1/}	Specific Gravity	Chip Color ^{2/} Weeks after harvest			Average
	US 1A	Total			1	2	3	
Ontario	249	267	7.0	1.072	5	3	4	4.0
WF 31-4	244	258	6.8	1.081	3	3	3	3.0
WF 46-4	244	261	7.0	1.081	2	1	2	1.7
WF 46-3	233	244	6.3	1.077	2	2	2	2.0
B9535-9	228	237	6.0	1.072	3	3	4	3.3
Atlantic	226	240	7.0	1.080	2	2	3	2.3
B8702-18	220	240	7.5	1.073	2	2	2	2.0
B9792-69	213	229	6.0	1.073	2	2	2	2.0
B9566-11	201	232	6.0	1.073	5	1	5	3.7
B9340-13	198	227	7.8	1.073	2	2	3	2.3
B9792-70	198	206	6.3	1.068	2	3	1	2.0
Green Mountain	194	219	5.8	1.079	3	5	6	4.7
B8682-19	193	209	6.3	1.073	2	2	1	1.7
B9792-136	193	206	7.3	1.074	2	1	2	1.7
B8682-23	192	207	7.3	1.089	2	2	2	2.0
Sebago	191	215	6.5	1.070	3	2	2	2.3
B9384-4	187	211	7.3	1.070	2	2	3	2.3
B9594-4	186	219	7.5	1.070	2	2	6	3.3
B9224-6	185	208	6.5	1.069	4	2	4	3.3
B8683-3	178	198	6.8	1.072	5	5	4	4.7
B9140-32	175	193	6.8	1.084	3	2	2	2.3
B8683-1	171	206	6.5	1.077	3	2	3	2.7
Superior	167	185	6.8	1.074	4	5	5	4.7
B9556-9	152	176	5.8	1.090	1	1	2	1.3
B9792-43B	150	159	5.3	1.069	3	2	7	4.0
B9792-97	143	180	7.5	1.069	2	2	2	2.0
B8702-14	140	159	6.5	1.073	2	2	2	2.0
B8702-15	137	170	6.5	1.072	2	2	3	2.3
B8687-8	136	150	8.5	1.085	2	2	2	2.0
B9192-1	135	142	6.5	1.060	2	2	3	2.3
B8702-36	125	146	6.3	1.072	3	2	2	2.3
B9535-1	119	155	5.8	1.068	3	5	4	4.0
B8702-31	103	124	6.8	1.079	2	2	2	2.0
LSD (0.05)	33	31	0.9	0.004	-	-	-	-
(0.01)	43	42	1.2	0.006	-	-	-	-

1/ From 10.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 3. Results from several russet skin clones selected for advanced testings at Hastings, Florida -- 1984.

Cultivar	Yield (cwt/A)		Tuber Appear- ance ^{1/}	Specific Gravity
	US1A	Total		
WF564-3	255	287	4.8	1.058
Russette	245	282	7.3	1.073
Norgold #40	231	302	5.0	1.060
Centennial	226	262	7.3	1.065
B9648-9	215	259	7.3	1.061
Norgold	188	218	5.3	1.068
A69.72-2	184	216	5.8	1.065
ND388-1	181	216	6.5	1.069
ND534-4	176	220	6.3	1.065
A71.72-1	174	235	4.5	1.065
B9569-2	171	233	6.3	1.066
B9553-6	171	211	6.8	1.060
CF7750-1	170	191	6.5	1.066
B8972-1	161	198	7.3	1.066
Norgold 10-7	159	201	5.3	1.064
B9540-62	157	206	7.0	1.061
Norgold 1916	156	200	4.8	1.062
Norgold #12	151	187	5.8	1.068
B9400-5	127	159	6.5	1.061
GoldRus	113	167	5.8	1.065
B9398-2	110	179	4.8	1.068
BelRus #2	92	152	7.8	1.073
BelRus #4	85	142	6.5	1.072
BelRus #6	79	143	7.0	1.073
BelRus	68	110	6.8	1.072
Russet Burbank	66	251	3.0	1.066
LSD (0.05)	46	42	1.3	0.004
LSD (0.01)	61	56	1.7	0.005

1/ From 10.0 = most desirable to 0.0 = completely undesirable.

LOUISIANA

James F. Fontenot, D. W. Newsom, H. M. Brewer and
P. W. Wilson

Introduction

The principal objectives of the Louisiana potato breeding project are wide adaptability, high yield, frost, heat and drought resistance, insect and disease resistance (particularly late blight and scab), improved culinary quality (including chipping quality, french frying quality, and baking quality), resistance to after-cooking darkening, improved storage ability, better shape and skin color and resistance to tuber greening. Development of an oblong russet type adapted to Louisiana conditions is highly desirable.

Other objectives are to gain further insight into the physiological changes during rest and to ascertain the effect of growth regulators, applied as preplant, preharvest and postharvest treatments on the production, storage ability and quality of potatoes. The total alkaloid content must be investigated. Air pollution may be a limiting factor in potato production and cultivar selection is essential to minimize yield losses.

Louisiana Trials

True seed from 42 families were planted in the greenhouse on 10/11/83 and harvested on 1/16/84. Approximately 10,000 individual tubers were selected and stored at 40° F and 85% relative humidity till May. These were then shipped to Starks Farms and planted in the field in early June and harvested on September 26 and 27. Exactly 99 clones were considered worthy of further research.

Yields were good at Starks and of the 227 clones selected in 1983 only 42 seemed to be adapted to both Louisiana and Wisconsin.

In 1982 the selections numbered 115. This was reduced to 46 at Rhinelander in 1983 and then to 12 in 1984.

Other clones which look good at this writing are 12-56; 12-59; 01-27; 01-38; 01-41; 010-47; 42-38; 71-96; 31-124; 81-20; 82-119; 43-18, and A11-62-90-64.

An old idea used by plant breeders for years has surfaced as a new development - that is planting potatoes from true seed in the field. This method would eliminate the storage, handling and shipping of 1000 to 2000 pounds of tubers which is required to plant one acre of potatoes. That would do away with seed-piece treatment and prevent many diseases.

Though the potato is an excellent food and can be prepared in many ways, the per capita consumption in some parts of the world; tropical America, Africa, and Asia; is low.

With the above in mind and the introduction of Explorer (a true seed cultivar) we went one step further in our routine procedure and planted true seed directly in peat pots on 2/15/84 and transplanted them in the field on 3/22/84. True seed from families 31-124; 42-38, and 81-20 were compared to seed-pieces of these three clones. Seed-pieces of 31-124 yielded 11.6 pounds per 10 foot plot compared to 0.8 pounds for the true seed plots of this clone. Dr. C. A. Jaworski claims that true seed from La. 31-124 has outperformed all other clones he has tested by this method of propagation and we are cooperating with him in his research.

The potato regional trial was planted at Baton Rouge, 3/8/84, and harvested 6/15/84 and data is presented in Table 1. The number one entry was ND 860.2 which yielded 166 Cwt/A of US #1 tubers. The second rated clone was ND 388.1 Russ with a yield of 182 Cwt/A number one tubers; La. 01-38 was third and yielded 148 Cwt/A; W855 fourth with 118 Cwt/A and W779 with 153 Cwt/A. The check cultivars in this test were Red Pontiac, Norchip, Russet Burbank, and Norgold Russet and all clones were compared to these entries. We took the option of entering Red LaSoda in this test and if the entries were compared to this clone it is very obvious with a yield of 232 Cwt/A US #1's Red LaSoda would have to be rated high.

A summary of grade defects is presented in Table 2. No clones could be down graded on percent external and/or internal defects.

Data on other advanced clones grown at Baton Rouge are noted in Table 3. The best clones in this test was 12-59 which outyielded all clones except Red LaSoda. Tubers produced by this line are much more attractive than Red LaSoda. It was also found that potato chips from 12-59 tubers stored at 40°F for one month were acceptable.

Red LaSoda, LaChipper and Atlantic were compared to other clones in Table 4. Red LaSoda was the best red skin type and LaChipper was the best clone with a white skin.

The effect of chemical dip treatments on seed-pieces of Red LaSoda were investigated in the spring. The treatments were Daconil, Zineb, Botran, and Captan at 1000 and 2000 ppm. The greatest number and weight of tubers was obtained from 1000 ppm Botran treatment. No

significant difference was found in dry weight or weight loss of these tubers. A similar experiment was conducted fall 1984 using Red LaSoda and the same treatments except a dip treatment of GA₃ at 10 ppm was superimposed on these treatments. This experiment has not been harvested at this writing.

Louisiana, Table 1. Potato regional trial summary sheet conducted at Baton Rouge - 1984.

Selection Number or Variety	Aver. Mat. ¹	Most Representa- tive Scab Area-Type ²	CWT/A		Aver. Percent US#1	Total Solids	Gen. Merit Rating ³	Chip ⁴ Color
			Aver. Yield	Aver. Yield US#1				
EARLY TO MEDIUM EARLY								
Norland	1.0	0 0	161	110	68	15.4		5.9
MEDIUM TO LATE								
La 01-38	4.0	T 1	167	148	89	15.4	3	4.2
La 82-119	4.0	T 1	164	122	74	16.5		3.2
MN 10874	4.0	0 0	139	70	50	15.6		5.3
MN 11373	3.0	T 1	137	86	63	16.7		5.7
MN 11795	1.0	T 1	130	69	53	17.1		2.3
Red La Soda	4.0	0 0	274	232	85	15.4		4.7
ND 388-1 Russ	4.0	0 0	246	182	74	16.0	2	3.2
ND 534-4 Russ	4.0	0 0	102	57	56	15.6		4.8
ND 860-2	3.0	0 0	214	166	78	18.6	1	2.6
W 779	4.0	0 0	214	153	72	15.4	5	2.7
W 855	5.0	0 0	152	118	78	19.0	4	1.7
Red Pontiac	4.0	T 1	257	160	62	15.4		4.7
Norchip	4.0	0 0	230	137	60	15.6		2.4
Russet Burbank	5.0	0 0	134	82	61	15.6		4.6
Norgold Russet	3.0	0 0	260	126	48	15.4		5.6

1/ 1-Very Early-Norland maturity; 2-Early-Irish Cobbler maturity; 3-Medium-Red Pontiac maturity; 4-Later-Katahdin maturity; 5-Very Late-Kennebec or Russet Burbank maturity.

2/ AREA - T-less than 1%; 1 - 1020%; 2 - 21-40%; 3 - 41-60%; 4 - 61-80%; 5 - 81-100%. TYPE - 1. Small, superficial; 2. Larger, superficial; 3. Larger rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes.

3/ Place top five among all entries including check varieties; disregard maturity classification. (Rate first, second, third, fourth and fifth (in order) for overall worth as a variety).

4/ Chip Color - PCII Color Chart or Agtron.

Louisiana, Table 2. Summary of Grade Defects - Regional Trial - 1984

Percent External Defects¹

Selection Number or Variety	Scab ²	Growth Cracks	Second Growth	Sun Green	Total ³ Tubers Free of External Defects
<u>EARLY TO MEDIUM EARLY</u>					
Norland	0	0	10	0	90
<u>MEDIUM TO LATE</u>					
La 01-38	8	2	4	0	86
La 82-119	4	0	6	0	90
MN 10874	0	2	14	0	84
MN 11373	2	0	6	4	88
MN 11795	6	0	18	0	76
Red LaSoda	0	-	10	-	90
ND 388-1 Russ	0	0	8	0	92
ND 534-4 Russ	0	0	6	0	94
ND 860-2	0	0	0	0	100
W 779	0	12	2	0	86
W 855	0	0	0	0	100
Red Pontiac	2	4	10	0	84
Norchip	0	2	14	0	84
Russet Burbank	0	0	20	0	80
Norgold Russet	0	0	14	0	86

1/ Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

2/ Includes all tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area.

3/ This total - tubers free from any external defect of any sort.

Louisiana, Table 3. Data on other advanced clones grown at Baton Rouge. Planted 3/2/84, Harvested 6/15/84.

	US #1 cwt/A	Yield Total cwt/A	Percent US#1	Maturity*	Vigor**
12-2	59	91	65	1	1
12-9	74	89	83	3	3
12-33	81	94	86	4	4
12-35	56	124	45	4	4
12-56	59	75	79	1	3
12-59	168	182	92	3	4
01-24	78	104	75	3	3
01-27	63	136	46	3	3
01-41	99	115	86	3	4
01-47	33	56	59	4	3
Red LaSoda	166	195	85	4	4

*/ 1-very early, 5-very late

**/ 1-weak, 5-very vigorous

Louisiana, Table 4. Yield and other data on some advanced clones grown at Baton Rouge. Planted 3/8/84 Harvested 6/15/84.

	US #1 cwt/A	Yield Total cwt/A	Percent US#1	Maturity*	Vigor**	Chip Rating***
Red LaSoda	154	190	81	4	4	6.9
Lachipper	119	141	84	3	3	5.7
Atlantic	99	104	95	4	3	5.9
81-20	78	98	80	4	4	8.1
31-124	99	127	78	3	3	5.1
43-18	97	106	92	4	4	6.1
42-38	91	120	76	4	4	7.3

*/ 1-very early, 5-very late

**/ 1-weak, 5-very vigorous

***/ One month storage 40°F 1=very white; 10=very dark

MAINE - 1984

Hugh J. Murphy and Leigh S. Morrow
University of Maine; Orono and Presque Isle, Maine

A cooperative variety trial was conducted at Presque Isle, Maine during 1984 consisting of 45 entries. Soil and weather conditions were wet and cold through the last week in June. Throughout most of July and the first two weeks in August, soil moisture was low. Rainfall increased the soil moisture in mid-August but this was too late to benefit the early and medium early clones and varieties. Medium, medium late, and late varieties responded to the better moisture regime but unfortunately, the rapid growth caused excessive tuber growth cracks, hollow heart, and misshapen tubers.

Plots at Presque Isle were single rows, 25 feet long, and each clone or variety replicated six times. Planting, killing, harvesting dates, seedpiece spacing, and fertilization rates for each maturity group are presented in Maine Table 3.

Yields, specific gravities, and percentage of yield in two grade size classes for all clones and varieties grown at Presque Isle are presented in Maine Table 1. The five highest yielding varieties were: Erik, Red Pontiac, NY64, NY59, and Kennebec. Specific gravities for most varieties were quite high in 1984. The five highest were: CF7688-9, Lemhi, AF236-1, CF7679-15, and W752. Only three of the 45 varieties and clones were below 1.075 in specific gravity.

Results of the first chipping and french fry color tests with tubers from 50⁰ F storage are presented in Maine Table 2. Chip colors were unsatisfactory for most clones and varieties with only two of the 45 less than 7.0 in color. French fry colors were satisfactory (3.0 or less) for 23 of the 45 entries in test.

Complete details of the Maine cooperative trials will be published in the 1984 Performance Evaluations for Potato Clones and Varieties in the Northeastern States. This will be available as Bulletin #806 from the Public Information and Central Services (PICS), University of Maine; Orono, Maine 04469.

Maine Table 1. Yield by hundredweight per acre, percentage of yield between 1-7/8 and 4 inches in diameter, and specific gravity for varieties grown at Presque Isle, Maine - 1984.

Variety	Yield Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific gravity
Agassiz	219	46.2% 4 - 10 ounces		1.088
Alaska Russet	289	51.1% 4 - 10 ounces		1.098
Crystal	298	73.7	52.9	1.086
Erik	382	69.6	59.1	1.079
Gold Rus	249	58.3% 4 - 10 ounces		1.094
Hampton	342	82.0	67.9	1.097
Katahdin	306	79.8	68.0	1.097
Kennebec (Med.)	314	50.8	27.0	1.092
Kennebec (Med. late)	352	59.4	51.2	1.094
Lemhi	351	49.0% 4 - 10 ounces		1.104
Red Pontiac	382	82.6	71.7	1.084
Redsen	266	75.0	33.8	1.081
Rhine Red	330	78.8	47.0	1.094
Russet Burbank	300	52.4% 4 - 10 ounces		1.101
Superior	309	91.6	74.5	1.087
AF236-1	285	70.7	52.7	1.103
AF307-5	329	86.5	49.4	1.080
AF332-9	298	88.0	43.2	1.095
AF9058-M	293	48.4% 4 - 10 ounces		1.093
B5662-WV13	248	79.9	64.9	1.088
B6928-WV14	308	90.1	70.7	1.095
B6949-WV3	301	71.7	61.7	1.092
B7019-WV1	204	80.2	57.7	1.087
B7805-1	300	68.4	61.1	1.093
CF7587-7	302	89.4	63.2	1.100
CF7622-6	251	72.9	52.6	1.070
CF7679-15	339	90.1	77.8	1.102
CF7688-9	318	84.9	37.2	1.108
CF7719-6	212	77.5	59.1	1.071
CF7722-19	303	84.9	64.4	1.082
CF7750-1	245	48.2% 4 - 10 ounces		1.089
CF7789-1	242	47.8% 4 - 10 ounces		1.084
CF72107-15	257	87.5	74.9	1.085
CF72111-5	324	55.9% 4 - 10 ounces		1.097
CF74135-3	176	73.5	42.4	1.069
CF76136-11	221	76.8	39.7	1.091
CF76183-2	233	57.3% 4 - 10 ounces		1.082
CF77154-10	258	78.8	39.4	1.094

Maine Table 1 - continued

Variety	Yield Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific gravity
ND388-1	246	51.0% 4 - 10 ounces		1.094
ND534-4	258	42.8% 4 - 10 ounces		1.086
NY59	353	74.5	64.6	1.101
NY64	357	63.1	48.1	1.096
NY67	291	78.2	58.4	1.100
W752	245	45.8% 4 - 10 ounces		1.102
WF564-3	345	50.5% 4 - 10 ounces		1.088
Waller Duncan L.S.D. (0.05)	27			0.005

Maine Table 2. Chip color and french fry color and texture indices for potato varieties grown at Presque Isle, Maine - 1984.

Variety	Chip Color ^{1/}	French Fry	
		Color ^{2/}	Texture ^{3/}
Agassiz	7.7	1.2	2.9
Alaska Russet	9.4	3.5	2.3
Crystal	8.1	2.5	2.8
Erik	10.0	5.0	2.9
Gold Rus	8.6	2.8	2.2
Hampton	10.0	4.0	2.3
Katahdin	9.8	3.5	2.7
Kennebec (Med.)	8.9	2.8	2.4
Kennebec (Med. late)	8.9	2.4	1.7
Lemhi	9.2	3.5	2.3
Red Pontiac	10.0	4.9	2.6
Redsen	8.0	2.2	2.7
Rhine Red	9.9	3.6	2.3
Russet Burbank	8.9	3.2	1.7
Superior	8.0	1.9	2.6
AF236-1	6.9	1.5	2.6
AF307-5	8.4	3.0	2.5
AF332-9	9.6	3.6	2.3
AF9058-M	9.9	3.5	2.8
B5662-WV13	8.1	2.5	2.3
B6928-WV14	9.9	3.5	2.5
B6949-WV3	9.1	3.0	1.9
B7019-WV1	8.0	1.8	2.6
B7805-1	8.5	3.1	2.7
CF7587-7	8.5	2.8	2.1
CF7622-6	10.0	4.9	2.7
CF7679-15	9.7	3.5	2.3
CF7688-9	9.4	2.7	2.2
CF7719-6	9.0	2.6	2.7
CF7722-19	9.5	3.1	2.4
CF7750-1	9.8	4.4	2.9
CF7789-1	9.7	4.4	2.5
CF72107-15	7.7	2.2	2.3
CF72111-5	9.3	3.0	2.5
CF74135-3	8.7	3.0	2.2
CF76136-11	9.2	1.9	2.8
CF76183-2	7.3	1.5	2.5
CF77154-10	6.5	1.1	2.1

Maine Table 2 - continued

Variety	Chip Color ^{1/}	French Fry	
		Color ^{2/}	Texture ^{3/}
ND388-1	8.6	2.5	2.5
ND534-4	9.8	3.5	2.9
NY59	10.0	4.8	2.3
NY64	9.9	4.7	2.1
NY67	10.0	3.7	1.8
W752	8.0	1.9	1.7
WF564-3	10.0	4.7	1.8
Waller Duncan L.S.D. (0.05)	0.4	0.4	0.4

^{1/}Chips with lower index numbers are lighter in color.

^{2/}French fries with lower indices are lighter in color.

^{3/}Lower texture indices indicate a mealier texture.

Maine Table 3. Pertinent Information About the Maine Cooperative Potato Variety Trials.
Presque Isle, Maine - 1984.

Maturity Season	Date Planted	Date Killed	Date Harvested	Fertilization	Seedpiece Spacing
Early & Med. Early Varieties	May 21	August 30	September 11	125-125-125	<u>1</u> / ₂
Medium Varieties	May 21	September 6	September 17	125-125-125	<u>1</u> / ₂
Medium Late Varieties	May 21	September 13	September 19	125-125-125	<u>1</u> / ₂
Late Varieties	May 21	September 27	October 9	125-125-125	<u>1</u> / ₂
Russet & Long Type Varieties	May 21	September 27	October 11	125-125-125	<u>2</u> / ₂

1/₂ Seedpieces of all varieties spaced 8 inches apart.

2/₂ Seedpieces of Alaska Russet, CF7750-1, and CF7789-1 spaced 9 inches apart.

Seedpieces of Gold Rus spaced 12 inches apart.

Seedpieces of Lemhi and WF564-3 spaced 14 inches apart.

Seedpieces of Russet Burbank spaced 16 inches apart.

MAINE -- 1984

Alvin F. Reeves, Robert B. Long, and Garland S. Grounds

Potato Breeding

Seed and seedling production. Seed production emphasized high yields, long russet types, and resistance to leafroll, bruising, common scab, verticillium, acid scab, early blight, golden nematode, and rhizoctonia. A total of 54 parents were involved in 73 crosses producing 56,835 seeds. Open-pollinated fruits from field-grown plots yielded a total of 1,241,800 seeds. These came from three different sources: 39 12-hill plots (695,400), three advanced russets from the Campbell Institute program (503,900), and an advanced Campbell line with outstanding chip color (42,500). Greenhouse plantings of true seed yielded 55,643 seedlings from which 45,973 (83%) first tubers and 34,607 (62%) second tubers were harvested. The first tubers will be planted in single-hill plots for field selection; they include 9,877 russets and 1,675 with potential for chipping. The second tubers will be planted in various disease plots for resistance screening; they include potential for resistance to verticillium, leafroll, acid scab, common scab, and golden nematode.

Seedling selection. A total of 194 (0.8%) new selections were saved from 24,091 single hills. From the 237 12-hill plots, 101 (42.6%) were saved for further testing. Sixty-six 60-hill plots, 73 advanced selections, and 92 Campbell selections were maintained and tested.

Protoclonal selection. Over 250 clones from culture of Russet Burbank leaf protoplasts were field tested. Twenty-six of these were grown in replicated yield test plots; 14 will be retested in 1985.

Disease tests. In cooperation with Drs. Franklin Manzer, Richard Storch, Bill Brodie, Robert Goth, Gilbert Banville, Simeon Leach, and Robert Young, a number of selections were tested for resistance to several diseases. All tests were inoculated either directly or on spreader rows within the plots. Results were as follows: 17 of 101 selections tested were resistant to early blight; 1 of 13 to late blight; 47/107 to acid scab; 36/117 to common scab; 4/17 to leafroll; 39/148 to verticillium; 65/70 to net necrosis; and 34/194 to virus X.

Physiological disorders. Additional tests for physiological problems showed 43 of 60 resistant to blackspot bruising; 34/60 to shatter bruising; 60/193 to greening; and 28/102 to hollow heart.

Yield tests. A total of 126 selections were tested in replicated yield tests in 1984. Fifty-one yielded as well as the controls, 86 had gravities equal to controls, and 32 equaled controls for both. The tests were divided into early, medium-early, medium, and medium-late maturity classifications, and were killed at 91, 94, 100, and 111 days, respectively. Early and medium-early tests were given 115 pounds of nitrogen per acre, medium tests had 130 pounds of nitrogen, and medium-late tests, 145 pounds nitrogen.

Chip tests. After processing in December from four different temperatures, four selections had better chip color than Monona: AF 236-1, AF 324-1, CF 77154-10, and CS 7232-4.

Grower trials of advanced selections. Eight unnamed selections were grown on commercial farms in 1984: AF 92-3, AF 236-1, CF 7353-1, CF 7523-1, CS 7232-4, CS 7697-24, BR 7088-18, and WF 564-3.

WF 564-3 is the only russet selection. Its dry matter is low, and the potential is probably only for tablestock. However, yields are quite high, and quality good once the growth cracks are removed.

Five have potential as chipping selections: CS 7232-4 has excellent color, but yield and dry matter are marginal; BR 7088-18 has excellent dry matter and good yields, but color is marginal; CF 7523-1 has good yields and dry matter, and fair color; AF 236-1 has excellent color, good yields and dry matter, but is somewhat oblong in shape; CF 7353-1 has good color, yields, and dry matter, but also is somewhat oblong, and has a thin purple skin.

Round white tablestock selections with good potential include CS 7697-24 with very high yields at 90 days; CF 7523-1, a mid-season selection with good yields and quality (storage ability is uncertain at this point); BR 7088-18 yields well, but its advantages are limited to high dry matter and verticillium resistance; and AF 92-3 whose excellent disease resistant combinations (late blight, early blight, common scab, acid scab, and virus X) may not outweigh its marginal yield and quality.

Only one of these selections has good potential for processing and count boxes: AF 236-1 is an all-purpose selection, oblong white with good chip color, dry matter, yield, and appearance. Its potential problems are with hollow heart and scab.

Maine Table 1. Characteristics of some advanced selections from the Maine breeding program.

Pedigree	Resistance to <u>5/</u>												
	Maturity ^{1/}	Skin color ^{2/}	Tuber type ^{3/}	Yield ^{4/}	Cooked quality ^{4/}	Chip color ^{4/}	Percent dry matter ^{4/}	Storage qualities ^{4/}	Bruising ^{4/}	Hollow Heart ^{4/}	Virus X	Leafroll	Net necrosis
<u>Round white tablestock</u>													
<u>Early Maturing</u>													
*Sunrise	E	W	OR	A	G	A	G	A	M	E	R	S	R
AF686-3	E	C	R	E	A	A	M	F	E	E	S	S	S
*AF811-4	ME	B	RO	A	G	E	G	F	G	U	S	M	R
CF7679-15	EM	C	OR	E	E	M	E	F	U	U	R	S	S
*CF8003-2	ME	C	R	G	A	G	E	F	A	E	S	S	R
<u>Mid Season</u>													
AF474-2	M	W	O	G	A	U	A	F	M	A	R	S	R
AF790-1	M	C	R	G	A	A	A	F	E	E	S	S	R
AF828-5	M	W	RO	G	A	U	M	F	E	E	S	M	R
CF7523-1	M(E)	W	RO	E	G	A	A	M	G	E	S	R	R
*CF76136-11	M	WC	OR	M	G	G	E	F	E	E	S	S	R
<u>Full Season</u>													
AF303-5	ML	W	RO	G	M	M	G	F	G	E	S	S	S
AF612-1	ML	WN	R	G	G	U	A	F	G	U	S	R	S
AF798-2	ML	W	R	E	A	G	A	F	G	U	S	M	S
<u>Russet tablestock</u>													
WF564-3	ME	R	O	E	A	U	A	G	G	A	R	S	S
WF591-1	ME	R	OR	G	A	M	G	F	G	A	S	R	S

Golden nematode

Verticillium

Common scab

Acid scab

Early blight

Late blight

Maine Table 1. Continued

Pedigree	Resistance to <u>5/</u>										
	Maturity ^{1/}	Skin color ^{2/}	Tuber type ^{3/}	Yield ^{4/}	Cooked quality ^{4/}	Chip color ^{4/}	Percent dry matter ^{4/}	Storage qualities ^{4/}	Brusings ^{4/}	Hollow Heart ^{4/}	Virus X
Long russet for processing or count box											
AF465-2	ME	R	OL	M	A	M	A	F	E	M	S
AF522-1	M	R/W	OL	A	A	U	G	F	A	E	S
AF522-5	M	R	OL	U	G	U	E	F	A	G	M
AF702-4	ME	R	OL	U	A	U	G	F	G	M	S
CF77146-6	M	R	OL	U	E	A	A	F	A	M	R
CF80218-1	E	LR	O	G	M	U	E	F	A	G	S
Long white for processing or count box											
*AF236-1	ME	WC	OL	G	A	E	G	A	A	M	S
AF339-5	ME	W	OL	G	A	A	E	F	M	A	S
CF7598-4	E	B	OL	A	A	M	E	F	M	A	S
CF79280-1	E	WC	OL	A	A	U	E	F	G	G	S
Chipping types*											
AF324-1	M	C	R	U	A	E	E	F	A	G	S
AF330-1	E(M)	W	R	A	A	E	G	F	M	A	S
AF564-1	ML	Y	R	A	A	G	E	F	A	E	M
CF7353-1	ML	Pu	O	G	E	G	G	G	M	G	R
CF77154-10	E	C	OR	M	A	G	E	F	A	E	S
Golden nematode											
Verticillium											
Common scab											
Acid scab											
Early blight											
Late blight											
Net necrosis											
Leafroll											

Maine Table 1. Continued

-
- 1/ E = early, M = medium, L = late.
- 2/ W = white, C = cream, Y = yellow, B = buff, R = russet, Pu = purple,
Re = red, L = light, D = dark.
- 3/ R = round, O = oblong, L = long.
- 4/ Rated as U = unacceptable, M = marginal, A = acceptable, G = good,
E = excellent, F = further testing needed.
- 5/ R = resistant, M = moderately resistant, S = susceptible, F = further
 testing needed.

* Good chip color selections.

Maine Table 2. Characteristics of some advanced selections from the Campbell breeding program.

Pedigree	Resistance to <u>5/</u>													
	Maturity ^{1/}	Skin color ^{2/}	Tuber type ^{3/}	Yield ^{4/}	Cooked quality ^{4/}	Chip color ^{4/}	Percent dry matter ^{4/}	Storage qualities ^{4/}	Brusings ^{4/}	Hollow Heart ^{4/}	Virus X	Leafroll	Net necrosis	Late blight
Round white tablestock														
Early Maturing														
AS313-10	E	DC	RO	G	G	U	U	F	M	E	S	S	R	S
CS7589-8	E	W	R	E	A	A	U	F	E	A	S	S	R	S
CS7639-1	E	W	RO	E	A	U	M	F	A	A	R	S	R	R
*CS7757-3	ME	DC	O	E	A	A	G	F	G	U	S	S	R	R
Mid Season														
CS7685-6	M	WC	RO	G	A	U	G	F	A	E	S	S	R	R
CS76123-21	M	B	R	G	M	A	E	F	G	A	S	S	S	S
CS76148-18	M	W	R	E	A	U	U	F	A	E	R	S	S	S
CS7958-1	M	W	O	E	A	U	U	F	G	E	S	S	S	S
Full Season														
Campbell 14	ML	W	OR	E	A	A	G	G	A	A	S	S	R	S
BR7088-18	ML	C	R	G	A	A	E	F	G	M	S	S	S	S
*CS7635-4	L	W	R	E	A	A	G	F	A	A	R	S	R	R
CS76123-36	L	WC	OR	E	A	U	A	F	G	E	R	S	S	S
CS7910-6	ML	WC	R	A	A	M	A	F	G	E	R	S	M	R
Russet tablestock														
CS77120-8	M	LR	RO	E	A	M	G	F	E	U	M	S	R	S
Golden nematode														
Verticillium														
Common scab														
Acid scab														
Early blight														
Late blight														

Maine Table 2. Continued

Pedigree	Resistance to 5/												
	Maturity ^{1/}	Skin color ^{2/}	Tuber type ^{3/}	Yield ^{4/}	Cooked quality ^{4/}	Chip color ^{4/}	Percent dry matter ^{4/}	Storage qualities ^{4/}	Bruising ^{4/}	Hollow Heart ^{4/}	Virus X	Leafroll	Net necrosis
Long russet for count box or processing													
CS73105-2	ME	R	O	G	M	U	M	F	G	E	S	S	R
CS7598-1	ME	R	OL	M	A	G	E	F	A	E	S	S	R
Long white for processing or count box													
CS7747-7	E	C	L	E	G	U	G	F	A	U	S	S	R
CS7981-7	M	C	OL	E	A	M	G	F	G	C	S	R	R
Chipping types*													
CS7232-4	ME	WC	RO	U	G	E	G	F	A	E	S	S	R

1/ E = early, M = medium, L = late.

2/ W = white, C = cream, Y = yellow, B = buff, R = russet, Pu = purple, Re = red, L = light, D = dark.

3/ R = round, O = oblong, L = long.

4/ Rated as U = unacceptable, M = marginal, A = acceptable, G = good, E = excellent, F = further testing needed.

5/ R = resistant, M = moderately resistant, S = susceptible, F = further testing needed.

* Good chip color selections.

Golden nematode

Verticillium

Common scab

Acid scab

Early blight

Late blight

MICHIGAN

R.W. Chase, R.B. Kitchen, and R. Hammerschmidt

Dates of Harvest

The 1984 dates-of-harvest study was conducted at the Montcalm Research Farm with 20 varieties and numbered selections. Three complete plantings of all varieties were made on May 7 in plots 23 feet x 34 inch rows and 4 replications. Plant spacings were 12 inches within the row. Harvests were made on August 7 (92 days), August 30 (115 days) and September 17 (133 days after planting).

The previous crop was a sorghum-sudan hybrid, disked in the fall of 1983 and seeded to winter rye. Fertilizers used were 250 lbs/A 0-0-60 plowdown, 500 lbs/A 20-10-10 in the planter, and 225 lbs/A 46-0-0 sidedressed. Aldicarb (Temik 15G) was applied at 20 lbs/A at planting. The sidedress application of urea, hilling and herbicide application were completed just as the potatoes were ready to emerge which is a change from our usual management. Most of the hillings were completed by the end of May. The procedure used was to delay the herbicide application until the potatoes were just cracking the ground. The potatoes were then hilled by building a wide and flattened hill and placing just enough soil over the plants to protect them and then the tank mix of metolachlor (Dual) 2 lbs/A plus metribuzin (Lexone 4L) $\frac{1}{2}$ lb/A was applied. The sidedress urea was applied at the same time as hilling. This practice required no further tillage until harvest and as a consequence weed control was excellent. The early hilling did affect some varieties, however, in some cases this was influenced by rains which occurred soon after the hilling with a slight crusting which interfered with the emergence of some varieties (700-79, 701-22, 718-6 and Atlantic). As the season progressed nearly all plants emerged, however, some were weak. In general, this practice was very beneficial in terms of weed control and it did not show any adverse effects in terms of yield. The plots were irrigated and foliar insecticides and fungicides were applied as needed.

Results

Yields and quality were much improved over those of 1983 and more nearly like those of 1982 (Table 1). The average total yields at the first date of harvest were 44% higher in 1984 than in 1983 and at the second date of harvest (August 30) they were 16% higher. Specific gravity readings were also substantially higher in 1984; 1.084 at the first date of harvest in 1984 vs. 1.075 in 1983. These higher values reflect the advanced maturity of the 1984 crop compared with that of 1983. This is also reflected in the yields obtained at our last date-of-harvest. In 1983 we had an average total yield increase of 4% from August 31 to September 23 whereas we had no increase in 1984.

August 7 (92 days)										August 30 (115 days)										September 17 (133 days)											
Yield cwt/A		No.		No.		Percent Size Distribution		Pick Outs SGL/		Yield cwt/A		No.		No.		Percent Size Distribution		Pick Outs SGL/		Yield cwt/A		No.		No.		Percent Size Distribution		Pick Outs SGL/			
Variety	Total	1	1	<2"	2-3½	>3½				Total	1	1	<2"	2-3½	>3½					Total	1	1	<2"	2-3½	>3½						
Onaway	497	453	91	8	76	16	1	1.072		571	530	93	6	72	21	2	1.072		535	503	94	5	68	26	2	1.069					
Yankee																															
Supreme	412	378	92	8	86	6	1	1.091		415	377	91	9	78	13	1	1.086		396	364	92	8	82	10	1	1.085					
Yankee																															
Chipper	380	311	81	18	75	7	1	1.085		466	391	84	16	79	5	1	1.088		426	359	85	14	81	4	1	1.086					
MS704-10	364	308	85	15	79	6	1	1.093		503	429	86	14	75	11	1	1.089		437	370	84	16	79	5	0	1.091					
MS700-83	362	314	86	14	73	13	0	1.083		497	441	89	11	71	18	0	1.083		450	411	91	9	78	14	0	1.083					
MS702-91	360	325	90	10	68	22	1	1.083		478	449	94	5	77	17	1	1.086		481	452	94	6	73	22	1	1.084					
Conestoga	359	310	86	12	68	18	2	1.084		400	340	85	13	73	12	2	1.081		357	310	86	13	70	16	1	1.080					
MS714-10	350	287	81	15	65	16	5	1.077		427	371	87	12	74	13	2	1.078		396	352	89	10	72	17	1	1.077					
Atlantic	346	276	79	21	61	18	0	1.092		515	444	86	13	77	10	1	1.097		482	440	91	9	73	18	0	1.098					
MS716-15	332	282	85	15	75	10	1	1.094		411	365	89	11	81	9	0	1.097		404	345	86	14	78	8	0	1.095					
Monona	325	279	86	12	76	10	2	1.074		382	348	91	8	72	20	1	1.075		416	391	94	6	76	18	1	1.074					
Russet																															
Burbank	299	129	44	52	41	3	5	1.081		458	285	62	32	54	8	6	1.088		446	303	68	31	60	7	1	1.087					
Shepody	298	240	81	17	50	31	2	1.082		478	417	87	11	47	40	2	1.087		392	327	83	16	58	25	2	1.087					
G670-11	293	231	78	21	75	3	1	1.093		534	480	90	8	73	17	2	1.098		511	472	92	7	76	16	1	1.098					
Islander	288	225	78	20	72	6	2	1.082		416	336	80	19	74	6	1	1.087		419	354	85	15	82	2	1	1.089					
MS702-80	278	239	87	13	75	11	1	1.081		438	405	92	8	79	14	0	1.082		358	330	92	8	79	13	0	1.082					
Simcoe	277	256	93	7	84	8	0	1.086		357	327	92	8	77	15	1	1.092		308	293	95	5	73	23	0	1.086					
MS700-79	268	241	90	10	72	18	0	1.086		358	332	93	7	67	26	1	1.090		351	333	95	4	69	26	1	1.088					
MS701-22	221	196	88	10	56	32	3	1.083		388	365	94	6	59	35	0	1.088		360	339	94	5	56	39	1	1.089					
MS718-6	192	171	87	13	72	15	1	1.078		402	374	93	7	63	31	1	1.094		417	397	95	4	52	43	1	1.086					
AVERAGE	325	273						1.084		448	390						1.087		417	372						1.086					

1/ SG = Specific Gravity.

Yankee Supreme and Conestoga were the only varieties with the greatest yields at 92 days, the first date-of-harvest. On the other extreme, Monona, Russet Burbank, Islander and MS718-6 needed the full season of 133 days to produce their maximum yield of U.S. No. 1's. Most of the other varieties were at their optimum yields by early September.

Table 2 summarizes the internal defects, chip score and black spot damage. Samples for black spot determinations were collected from the second date-of-harvest (August 30) and were processed and scored through the Ore-Ida Foods, Inc. inspection line. Vascular discolorations were not major and those scored as slight would be of no grade concern. Hollow heart was noted as substantial on some selections, however, it was most prominent on tubers harvested on August 30.

Variety
Observations

MS700-79 - Yielded below average at all dates of harvest with satisfactory dry matter for chip processing. Hollow heart significant at August 30 harvest.

MS700-83 - Early emergence with good growth and vigor. An attractive round white. Yielded well above average, good dry matter and few internal defects. Mid-season maturity and good chip score even when held until December.

MS701-22 - Round white, medium-late maturity but below average yields. Very few internal defects and good chip color.

MS702-80 - Round white with good early emergence and vigor. Medium-late maturity, very few internal defects and very good chip color.

MS702-91 - A round to oblong white skin seedling with considerable tendency to pointed tubers. Good yields with medium-late maturity. No further testing because of lack of uniformity in tuber shape and appearance.

MS704-10(Y) - A round and somewhat flattened tuber with golden flesh. Mid-season maturity with above average yields. Sets heavy resulting in uniform sizing and smaller percentage of oversized tubers when compared to Yukon Gold. High specific gravity and very few internal defects. Tubers have a deeper eye than Yukon Gold.

MS714-10 - Selection deleted from further testing because of lack of good appearance, lower specific gravity and susceptibility to greening.

MS716-15 - Round white, shallow eyes, medium-late maturity and very high specific gravity. Yields slightly below average, very few internal defects and good chip color.

MS718-6 - Selection deleted from further testing because of later maturity, tendency to oversize and susceptibility to skinning.

Michigan Table 2. Internal defects^{1/}, chip scores and bruising damage of several potato varieties grown at the Montcalm Research Farm.

Variety	August 7 Harvest				August 30 Harvest				September 17 Harvest				December 11 ^{4/}	
	VAS DIS	INT NEC	H H	Chip ^{2/} Score	VAS DIS	INT NEC	H H	Chip ^{2/} Score	% ^{3/} Bruise Free	VAS DIS	INT NEC	H H	Chip ^{2/} Score	Chip Score
MS700-79	2 sl	1 bc	1	1.5	1 sl	2 bc	4	1.5	71	2 sl	0	1	1.0	2.0
MS700-83	2 sl	1	0	1.5	2 sl	1 bc	1	1.5	70	1 sl	1 bc	0	1.0	1.5
MS701-22	0	0	0	1.5	1 sl	0	0	1.5	50	0	1 bc	0	1.0	2.0
MS702-80	0	2 bc	1	1.0	0	5 bc	2	1.0	68	1 sl	1 bc	0	1.0	1.5
MS702-91	0	0	0	1.0	0	0	1	1.5	88	1 sl	0	0	1.0	1.5
MS704-10	0	0	0	2.0	0	0	1	1.5	49	1 sl	0	0	1.5	2.5
MS714-10	0	0	2	2.0	1 sl	1 bc	3	1.0	65	1 sl	1 bc	1	2.5	3.5
MS716-15	0	0	0	1.0	1 sl	0	0	1.0	71	1 sl	2 bc	1	1.0	2.0
MS718-6	0	0	2	1.5	1 sl	0	2	2.0	57	1 sl	0	0	1.0	1.5
G670-11	0	0	2	2.5	1 sl	0	10	1.5	51	4 sl	0	0	2.0	2.5
Shepody	0	0	0	2.0	4 sl;	0	1	2.0	82	3 sl	0	0	1.5	2.5
					4 sev									
Simcoe	0	0	0	1.5	1 sl	0	3	1.5	44	0	0	0	1.0	1.0
Conestoga	0	1	3	1.5	1 sl	0	2	3.5	77	1 sl	0	0	1.0	2.5
Yankee Chipper	0	0	0	1.5	2 sl	0	0	1.0	83	2 sl	1 bc	0	1.0	1.5
Yankee Supreme	0	0	2	1.5	0	0	1	2.0	50	0	0	1	2.0	3.0
Islander	0	0	0	2.0	1 sl	0	6	2.5	73	5 sl	0	2	1.0	2.0
Atlantic	1 sl	1 bc	2	1.5	2 sl	0	2	1.5	48	1 sl	0	1	1.0	1.5
Onaway	0	0	0	3.0	2 sl	0	1	3.5	76	2 sl	0	0	3.0	4.5
Monona	0	0	1	1.5	1 sl	0	1	1.5	70	2 sl;	0	0	1.0	2.0
										1 sev				
Russet Burbank	0	0	0	3.5	0	0	3	2.5	81	0	1 bc	1	1.5	3.0

1/ 20 tubers cut to determine internal defects.

VAS DIS = vascular discoloration; INT NEC = internal necrosis; H H = hollow heart; sl = slight; sev = severe; bc = brown center

2/ Chip score based on PC/SFA 1-5 scale. 1 = lightest, 5 = dark, not acceptable.

3/ Percent of tubers with no black spot damage.

4/ Samples stored at 52° F since harvest and processed on December 11, 1984.

G670-11 - A round white advanced seedling from Agriculture Canada-Guelph. Late maturity, very vigorous growth and very high yields and specific gravity. Considerable hollow heart noted, some growth cracks and chip color not as desirable as in previous years.

Atlantic - A standard variety with very good yields, specific gravity and appearance. Very good chip color, however, hollow heart noted at all dates of harvest.

Conestoga - An early maturing (Agriculture Canada-Guelph) round to oblong, white skin variety with deep eyes and some growth crack noted. Well above average yields at first date of harvest, good specific gravity and good chip score. Most suitable as an early maturing, out-of-the-field variety.

Islander - An elongated white tuber and late maturing variety from University of Maine and Cornell. Below average yields, medium specific gravity, some hollow heart and not dependable as a consistent chipper.

Monona - A standard chipping variety.

Onaway - A standard, early maturing, fresh market variety.

Russet Burbank - A standard fresh market and frozen processing variety.

Shepody - A medium-late maturing long, white variety (Agriculture Canada-Fredrickton) for frozen processing. Matures 2-3 weeks earlier than Russet Burbank, similar specific gravity, sets few tubers than Russet Burbank, but sizes them very quickly. Some susceptibility to scab.

Simcoe - A round white variety (Agriculture Canada-Guelph), medium-early maturity with below average yields. Few internal defects except hollow heart at August 30 harvest. Very good chip color, but appears very susceptible to scab.

Yankee Chipper - A round to elongated white, released from Maine with above average yields at 92 days. Medium-high specific gravity, few internal defects and good chip color.

Yankee Supreme - A round to oblong white variety, released from Maine. Medium-late maturity although it sized tubers early in our studies. Some hollow heart noted at all 3 harvests and chip color not as desirable at later harvests or after 3 months storage.

Samples of all selections were collected from the third date of harvest and stored at 40 F for further studies on after cooking darkening, out-of-storage chip quality and reconditioning.

Northeast
Regional Trial

Sixteen selections were evaluated in the Northeast regional trials which represents selections being evaluated in 14 locations. Plot design, fertilizers and production management were similar to the dates-of-harvest study. Planting date was May 9 and harvest was October 2, 147 days after planting.

Table 3 summarizes the yield and quality results. Hampton (NY63) is late maturing, similar to Katahdin, primarily for fresh market and does have some scab susceptibility. F7300-8 is an oblong, very late maturing yellow flesh variety. Tuber shape and appearance was not desirable and there was a high percentage of pick-outs. Alasclear is a recent release from Alaska which has good resistance to scab, however, tuber shape was not uniform and attractive at harvest. It's primary use would be for tablestock.

Selections which show the greatest values for further evaluations were Hampton, Alasclear, Sunrise (CF7358-14), WF564-3, G654-2, CF7587-5 and CF7789-1.

USDA-Beltsville
Trials

Three separate trials evaluating selections from the USDA-Beltsville potato breeding program were conducted in 1984. Cultural, fertility and management practices used were the same as described in the dates of harvest study. Planting date was May 9 and harvested on October 2, 147 days after planting. Table 4 summarizes the data from the preliminary trials which represents selections with limited data in Michigan. Tubers from the russets, B9539-9 and B8687-3 did not size well with high percentages of tubers under 2 inches. B8687-3 also had scab and the tubers were pointed and did not have good general appearance. Scab was also noted on B9792-119, B9540-29, B9539-9 and B9752-7. Hollow heart was noted on 4 of 20 tubers of B9540-29, 2 of 20 for Atlantic and 1 each for B9752-7, B9581-10 and B9792-84. Internal browning or necrosis was noted in 5 of 20 tubers of B8682-4.

Table 5 summarizes the results of the selections entered in the USDA-Beltsville Inter-Regional trial. Similar trials are conducted in the northeast and eastern states along the coast and into Florida. As noted in other trials, the russet selections did not size their tubers well with a high percentage of tubers under 2 inches. The WF31-4, 46-3 and 46-4 selections are white flowered "Atlantic" types which are being evaluated for internal defects as compared with Atlantic. Yields, size distribution, specific gravity and chip scores are very similar. Of the 20 tubers selected at random and used for the chip sample on September 24, WF31-4 had 2 hollow, WF46-3 had 1 and Atlantic and WF46-4 had none. When 8 large tubers (over 3½ inch) were selected and cut, Atlantic had 3 hollow, WF31-4 had 5, WF46-3 had 3 and WF46-4 had 4 which suggests very little predictive difference among the 3 selections and Atlantic. There was no internal browning

or necrosis in any of these selections. Internal defects were minimal in all of these selections and all produced very acceptable chips except B9400-5, B9596-2, B9553-6 and B9569-2. WF46-3 did have considerable growth crack as did GoldRus, B9648-9 and B9553-5. B9540-62 is scheduled for release as NemaRus. This long russet selection has produced best in Hastings, Florida.

Table 6 summarizes the yield data for the five tuber samples which were selected at harvest from the screening trial. A total of 42 selections were evaluated and compared to Atlantic, Monona and Superior in the same trial. These data represent a single 8-hill plot which is not replicated. Nearly all selections were fully mature when harvested. It is intended that the most promising of these selections will be entered into larger and replicated plots in 1985.

Michigan Table 3. Yield, size distribution, specific gravity and chip scores of selections evaluated in the Northeast Regional Trial.

Variety	Yield cwt/A		Percent Size Distribution					Specific Gravity	Chip Score	
	Total	U.S. No. 1	U.S. No. 1	<2	2-3½	>3½	Pick Outs		September 24	December 12
Hampton	541	512	95	5	60	35	1	1.074	2.5	3.0
F7300-8(Y)	538	428	80	6	53	27	15	1.081	2.0	2.5
CF74135-3	505	436	86	12	75	11	2	1.063	2.0	2.5
WF564-3	469	314	67	33	63	3	1	1.069	3.0	4.0
B6949-WV3	468	438	94	6	66	27	1	1.074	2.5	2.5
Alasclear	464	425	92	6	85	8	2	1.083	3.0	3.0
BR7088-18	451	423	94	5	83	11	2	1.088	1.5	1.5
AF92-3	440	401	91	6	66	26	3	1.071	2.0	2.0
G654-2	409	334	82	19	78	4	0	1.063	2.5	2.5
CF7358-14	408	377	93	8	80	13	0	1.074	1.0	1.5
CF7587-5	388	324	83	16	82	2	1	1.081	2.5	2.5
CF7789-1	375	346	92	8	73	19	0	1.068	2.5	2.5
CF7722-19	369	315	85	15	80	5	0	1.070	2.0	3.5
AF330-1	363	333	92	7	70	22	2	1.081	1.0	1.5
CF7719-6	335	295	88	11	78	11	1	1.065	2.0	2.0
GoldRus	311	230	74	25	61	12	1	1.074	1.5	1.5
AVERAGE	427	371						1.074		

Michigan Table 4. Yield, size distribution, specific gravity and chip scores of preliminary selections from the USDA-Beltsville breeding program.

Variety	Yield cwt/A		Percent Size Distribution					Specific Gravity	Chip Scores	
	Total	U.S. No. 1	U.S. No. 1	<2	2-3½	>3½	Pick Outs		November 6	December 19
B9792-84	556	513	92	7	70	22	1	1.099	1.5	1.5
Atlantic	522	492	94	5	71	23	0	1.101	1.5	1.5
B8682-4	497	438	88	11	79	9	2	1.079	2.0	2.5
B9581-10	481	424	88	9	74	14	2	1.080	2.0	2.5
B9638-11	470	428	91	8	81	10	1	1.095	2.5	2.5
B8687-3(Y)	448	283	63	35	55	8	3	1.074	2.5	3.0
B9792-119	421	382	91	7	57	34	3	1.088	1.5	2.5
B9752-7-(Russ.)	373	268	71	27	56	15	1	1.070	3.0	3.0
B9540-55 (Russ.)	356	219	62	37	57	4	2	1.075	2.0	2.5
B9539-9	345	202	59	41	55	4	0	1.085	1.5	3.0
B9540-29 (Russ.)	290	210	72	23	58	15	4	1.080	2.0	2.5
AVERAGE	433	351						1.084		

Michigan Table 5. Yield, size distribution, specific gravity and chip scores of potato varieties in the USDA-Beltsville Inter-Regional Trial.

Variety	Yield cwt/A		Percent Size Distribution				Specific Gravity	Chip Scores	
	Total	U.S. No. 1	U.S. No. 1	<2"	2-3 $\frac{1}{4}$	>3 $\frac{1}{4}$		September 24	December 13
WF31-4	491	446	90	9	73	18	1.102	1.5	1.5
Atlantic	484	451	93	7	66	28	1.099	1.5	1.5
WF46-4	470	426	91	8	73	18	1.095	1.5	1.0
WF46-3	449	397	89	9	70	19	1.097	1.5	1.5
B9192-1	424	396	93	5	48	45	1.077	1.5	2.0
B9140-32	419	383	92	9	88	4	1.092	1.0	1.0
B9400-5 (Russ.)	408	358	88	11	58	29	1.075	2.5	3.0
B9384-4	408	302	74	26	74	0	1.076	1.0	1.5
B9596-2 (Russ.)	405	312	77	24	68	9	1.075	3.0	4.0
B9553-6 (Russ.)	389	304	78	18	56	22	1.074	2.0	2.5
B9340-13	368	348	92	7	79	14	1.081	1.5	1.5
B9569-2 (Russ.)	363	257	71	28	61	10	1.075	3.0	1.5
B9648-9 (Russ.)	347	241	69	29	64	6	1.070	2.0	1.5
GoldRus (Russ.)	327	235	72	25	60	12	1.078	1.5	1.5
B9540-62 (Russ.)	316	243	76	23	66	11	1.075	2.0	2.0
B9398-2 (Russ.)	309	239	70	20	64	14	1.082	1.5	2.0
AVERAGE	399	334					1.083		

Michigan Table 6. Yield, size distribution and specific gravity of several seedlings selected at harvest from eight-hill plantings of USDA-Beltsville selections.

Cultivar	Yield cwt/A		Percent Size Distribution			Specific Gravity	Chip Scores		Comments
	Total	No. 1	<2"	2-3 1/4"	>3 1/4"		November 2	December 17	
B9988-23	616	578	3	85	9	1.081	1.5	1.0	short dormancy
B9581-10	559	521	7	64	29	1.085	2.0	1.5	long dormancy
B9933-20	530	483	7	82	9	1.082	1.5	1.5	
B9988-14	521	502	2	82	15	1.079	1.0	1.0	short dormancy
B9956-14	511	474	7	70	23	1.078	3.0	2.0	
B9582-18	492	455	8	81	11	1.083	2.0	2.0	
Atlantic	492	455	6	73	19	1.097	1.0	1.5	
B9934-51	426	407	4	78	18	1.060	1.5	1.5	long dormancy
B9967-1	417	388	7	84	9	1.092	1.0	1.5	short dormancy
B9581-2	407	388	2	67	28	1.077	1.0	1.0	sl. growth crack
B9959-20 (Russ.)	407	388	5	58	37	1.069	1.5	1.5	long, dark russet
B9955-21	398	379	5	79	16	1.080	1.0	1.0	short dormancy
B9999-3 (Russ.)	398	360	7	76	14	1.077	2.5	3.0	oblong russet
B0019-2 (Russ.)	369	313	15	85	0	1.071	3.0	3.5	oval russet
MS002-171(Y)	360	303	6	63	21	1.079	1.5	2.0	knobs and off type
B0016-13 (Russ.)	350	284	14	68	13	1.065	2.0	2.5	long russet
Superior	341	294	8	83	3	1.072	1.5	2.0	
Monona	294	265	10	87	3	1.068	1.0	1.0	

Planted: May 9, 1984

Harvested: September 11, 1984

MINNESOTA

F. I. Lauer, C. Miller, D. Wildung, J. Wiersma, R. Wenkel,
D. Smallwood, M. Burke and B. Smith

INTRODUCTION

This past year, MN9648 was named Krantz in honor of Dr. Fred Krantz, who did much of the pioneer work in potato breeding in the U.S. relating to the development of pollen fertile parents and initiation of the IR-1 project, "Introduction, preservation, classification, distribution and evaluation of *Solanum* species". Dr. Krantz was in charge of the potato breeding project, Department of Horticulture, University of Minnesota from 1922 to 1959.

'Krantz' is an attractive russet skinned selection. Its tubers are blocky in shape and resemble tubers of 'Norgold Russet' except that they are thicker. The eyes are shallow and general ratings for tuber appearance are superior to those of 'Norgold Russet' and 'Burbank Russet'. The rest period of 'Krantz' is shorter than 'Norgold Russet' or 'Burbank Russet'. Its processing quality for frozen french fries is excellent compared to 'Russet Burbank' while chipping quality is marginal. Its specific gravity is intermediate.

It has extremely high resistance to common scab and very high field resistance to late blight. It is susceptible to viruses s and x, Verticillium wilt, and early blight.

The haulm of 'Krantz' is vigorous and open having a profusion of large white flowers throughout most of the growing season. Tubers, however, reach marketable size earlier than 'Norgold Russet' but the haulm matures later than 'Norgold Russet' and earlier than 'Burbank Russet'. 'Krantz' appears adapted to the irrigated sands. On heavier dry land soils like the Red River Valley or the peatlands, excessive growth cracking can occur.

'Krantz' is a product of MN 366.65-3 x GC743-5. MN 366.65-3 was a *S. tuberosum* seedling from Minnesota while GC743-5 was a parent obtained from Guelph, Ontario. GC743-5 was the source of russeting and is the product of complex matings of unadapted germplasms.

'Krantz' was selected simultaneously in the seedling population by both the Minnesota and Texas breeding programs; hence, it is a joint release by both the Minnesota and Texas Agriculture Experiment Stations.

The characteristics for 'Krantz' are summarized in Table 1.

Minnesota Table 1. Summary of performance for Krantz (MN9648), 1979-1984

1. Parentage: MN 366.65-3 x GC743-5.
2. Maturity: Foliage in late but tuberization is medium early.
3. Tuber shape: Blocky.
4. Tuber color: Russet.
5. Specific gravity: Medium.
6. Eating quality: Boiled, excellent; baked, good; french fry, excellent.
7. Chipping quality: Marginal.
8. Hollow heart resistance: High.
9. Disease resistance: Common scab, extremely high; late blight, very high field resistance; verticillium wilt, low.
10. Area of adaptation: Irrigated sands.
11. Strengths: High grade-out, sizes fairly early, attractive tuber shape.
12. Weaknesses: Will growth crack in heavier soils.
13. Data: Becker late harvest, 1979-1984.

<u>Variety</u>	<u>Maturity</u> ¹	<u>Tuber</u> ² <u>type</u>	<u>Marketable</u> ³ <u>yield</u>	<u>Specific</u> <u>gravity</u>	<u>Hollow</u> ⁴ <u>heart</u>
Burbank	5.4	3.2	58.4	1.079	1.50
Norgold	3.3	2.0	52.6	1.072	0.80
MN 9648	4.7	1.8	56.4	1.075	0.20

1/ Scale, 1-6: 1, early; 6, late, RRV data only.

2/ Scale, 1-5: 1, good; 5, poor.

3/ 20 hill plots, lbs.

4/ Number of hollow tubers from 6 per plot.

New Jersey 1984

Melvin R. Henninger

Key to interpret the data in the following tables.

Market cwt/a = Yield of tubers over 1 7/8" and not a cull.

Total cwt/a = Yield of all tubers.

Culls = Includes mostly green, second growth, growth cracks, and badly misshapen tubers.

<u>AP = Air Pollution</u>	<u>Mat = Vine Mat.</u>	<u>Tuber Color</u>	<u>Text = Tuber Texture</u>
1 = plant are dead	1. very early	1. purple	1. part russet
2 = (decreasing plant appearance)	2.	2. red	2. heavy russet
3 = (with all leaves having symptoms)	3. early	3. pink	3. mod. russet
4 = (increasing defoliation)	4.	4. dark br.	4. light russet
5 = most leaves have speckling or bronzing	5. medium	5. brown	5. net
6 = (plant in generally good condition)	6.	6. tan	6. slight net
7 = (with increasing percent of)	7. late	7. buff	7. mod. smooth
8 = (foliar symptoms)	8.	8. white	8. smooth
9 = no symptoms visible	9. very late	9. bright wh.	9. very smooth

<u>Tuber Shape</u>	<u>Tuber Depth</u>	<u>Tuber Appearance</u>	<u>Tuber Eye Depth</u>
1. very round	1. very flat	1. very poor	1. very deep
2. mostly round	2.	2.	2.
3. round to oblong	3. flat	3. poor	3. deep
4. mostly oblong	4.	4.	4.
5. oblong	5. ok	5. fair	5. medium
6. mostly oblong	6.	6.	6.
7. oblong to long	7. good	7. good	7. shallow
8. mostly long	8.	8.	8.
9. very long	9. very round	9. excellent	9. very shallow

<u>Tuber Defects</u>	<u>Disease and Tuber Defect Ratings</u>	<u>Tuber Skin Set</u>	<u>Chip Color</u>
SecGr = Second Growth	1. dead	1. very poor	1 - 4 acceptable
Gr.Cr = Growth Cracks	2. very severe	2.	5. borderline
Ht.Sp = Heat Sprouts	3. severe	3. poor	6 or higher too dark
HH = Hollow Heart	4.	4.	
HN = Heat Necrosis	5. moderate	5. fair	Each is a chip color
	6.	6.	value. The first is 2-3
No. = number of HH or HN	7. slight	7. good	days after harvest and
out of 10 tubers cut.	8. very slight	8.	4-5 days between each
Rate = Rating of severity of	9. none	9. excellent	of the other observations
the HH or HN.			

New Jersey Table 1. Yields, Specific Gravities, Tuber Sizes, Plant and Tuber Ratings for 12 Entries Grown on a Sandy Loam at the Rutgers Research and Development Center - Bridgeton, NJ 1984. (1)

	Market Cwt/A	Total Cwt/A	Spec. Grav.	Percent Over		Culls	M A p t	C o l e x r t	S D h e a p t p e h	S G e r c . G r	S H t . S e s t p	H H R a t e	H N R a t e	Chip Color
				1 7/8	2 1/2									
Caribe	190	218	1.073	87	33	0	7 4	1 7	2 6 8	6	7 9	8 9	- 9	- 9
Erik	243	309	1.056	79	31	8	7 5	2 7	5 7 6	7	5 9	7 9	- 9	2 8
Hudson	264	299	1.080	88	66	8	8 8	8 8	3 6 6	8	7 8	4 9	- 9	1 7
Norland	196	237	1.059	82	15	2	4 2	2 7	2 6 8	6	7 9	8 9	- 9	1 7
R Pontiac	252	351	1.057	72	31	16	7 6	2 6	2 7 6	6	2 7	5 2	- 9	1 8
Redsen	164	203	1.063	81	14	2	2 2	2 7	2 5 6	9	9 7	8 9	- 9	1 8
Rhine Red	174	230	1.069	76	19	4	8 4	2 5	2 7 6	8	8 7	6 9	- 9	1 7
Superior	257	288	1.070	89	41	3	7 5	6 5	4 7 6	5	7 7	9 9	- 9	2 7
B8710-	1	272	1.067	82	25	3	7 5	8 7	3 7 4	7	9 9	7 9	- 9	- 9
B9581-	2	237	1.066	86	51	7	7 4	8 7	2 7 6	7	9 6	6 9	- 9	- 9
B9594-	4	289	1.075	53	4	17	8 5	7 6	5 7 5	8	5 9	5 6	- 9	1 7
Denali	228	283	1.086	80	32	4	6 7	8 8	2 8 7	8	7 7	7 9	- 9	2 7
Grand Mean	212	268	1.068	80	30	6								
CV	18	17	-	6	30	46								
Bayes LSD.05	78	88	-	7	14	5								

(1) All Plots were 24' long and 3' wide with 4 replications. Seed pieces were spaced 9" apart in 36" rows. Commercial cultural practices were used which included overhead irrigation. The trial was planted on April 3 and Harvest on August 10. This field has had potatoes in it since 1981.

New Jersey Table 2. Yields, Specific Gravities, Tuber Sizes, Plant and Tuber Ratings for 24 Entries Grown on a Sandy Loam at the Rutgers Research and Development Center - Bridgeton, NJ 1984. (1)

Market	Cwt/A	Total Cwt/A	Spec. Grav.	Percent Over		Culls	%	M A A P U	C o T	S D h e A	E y e	S G e r c . G C e S .	S H . t S .	H H		H N		Chip Color
				1 7/8	2 1/2									R	N a	R	N a	
B8682-	7	237	1.072	85	37	6	8 7	8 7	8 7	3 5 5	7	6 9	5 6	-	9	-	9	33433
B8701-	12	295	1.073	81	28	8	8 6	7 7	3 7 5	6	7 5	6 9	6 9	-	9	-	9	23444
B8702-	14	272	1.062	76	30	10	7 4	9 8	8 4 4	6	6 4	3 6	3 6	-	9	2 7	3 6	23323
B8706-	8	261	1.063	89	64	6	6 4	6 5	2 7 7	5	9 8	7 9	7 9	-	9	1 6	1 6	12322
B8706-	15	198	1.077	87	31	3	7 5	6 5	2 7 6	6	9 6	4 7	4 7	1 7	1 7	1 8	1 8	23633
B8798-	20	231	1.065	90	55	4	7 6	7 7	2 7 5	7	5 9	5 9	5 9	-	9	-	9	23323
B9514-	17	284	1.067	88	43	3	7 6	7 8	7 7 7	7	9 9	7 8	7 8	1 7	7 5	7 5	7 5	22424
B9514-	38	272	1.070	84	45	9	7 5	8 8	2 8 6	8	9 4	7 9	7 9	-	9	-	9	32534
B9516-	8	168	1.078	86	43	8	7 5	8 8	2 8 7	6	8 5	6 9	6 9	1 7	1 8	1 8	1 8	22233
B9527-	1	197	1.081	77	25	14	6 5	7 7	5 6 4	5	6 6	6 9	6 9	1 7	-	-	-	22424
B9530-	4	303	1.066	88	51	7	8 7	8 8	3 7 4	3	7 7	5 9	5 9	-	9	1 8	1 8	33323
B9532-	3	309	1.069	84	28	3	7 4	7 7	2 8 8	8	8 8	7 9	7 9	-	9	-	9	32534
B9533-	12	271	1.068	87	35	5	7 6	7 6	2 6 6	6	7 7	6 9	6 9	-	9	-	9	22233
B9536-	23	314	1.062	87	55	6	8 7	7 7	2 8 6	5	4 9	5 4	5 4	1 8	1 8	1 8	1 8	22424
B9536-	33	259	1.068	84	23	3	8 6	7 7	2 7 7	5	8 9	8 9	8 9	-	9	-	9	33323
B9541-	44	245	1.068	93	54	2	7 4	6 5	2 7 7	8	7 9	5 9	5 9	-	9	3 6	3 6	32534
B9792-	6	291	1.076	87	42	2	7 5	8 8	2 6 6	5	8 7	3 9	3 9	2 5	2 7	2 7	2 7	22422
B9792-	69	266	1.070	79	30	7	8 5	8 8	3 6 7	7	7 6	5 9	5 9	1 8	-	-	-	42422
B9792-	70	261	1.065	92	56	2	7 4	7 5	2 5 6	8	9 9	7 9	7 9	1 8	-	-	-	22422
B9792-119	263	311	1.072	84	45	7	7 6	6 5	2 6 6	8	8 6	6 9	6 9	-	9	4 6	4 6	22422
B9792-136	292	334	1.064	86	49	7	8 7	7 5	3 6 4	7	6 9	7 9	7 9	1 8	4 7	4 7	4 7	43322
Atlantic	321	372	1.076	86	46	2	7 5	6 5	2 7 7	7	8 9	6 9	6 9	-	9	8 5	8 5	43322
Katahdin	263	300	1.058	87	50	6	8 7	8 8	2 6 7	8	7 8	4 8	4 8	1 7	4 7	4 7	4 7	43322
Superior	321	358	1.069	88	45	5	7 5	7 5	3 6 7	5	6 7	9 8	9 8	-	9	3 7	3 7	55535
Grand Mean	254	295	1.069	86	42	6												
CV	25	21	4	5	26	66												
Bayes LSD.05	-	109	.004	7	16	6												

(1) All Plots were 24' long and 3' wide with 4 replications. Seed pieces were spaced 9" apart in 36" rows.

Commercial cultural practices were used which included overhead irrigation. The trial was planted on April 3 and Harvest on August 13. This field has had potatoes in it since 1981.

New Jersey Table 3. Yields, Specific Gravities, Tuber Sizes, Plant and Tuber Ratings for 24 Entries Grown on a Sandy Loam at the Rutgers Research and Development Center - Bridgeton, NJ 1984. (1)

Market	Total Cwt/A	Spec. Grav.	Percent Over		% Culls	M A p t	C o T I e a p p o x t p e h	S G e r c . G C e s . r r t p	S H t . S . e s . t p	H R		Chip Color			
			1 7/8	2 1/2						N a o t . e .	N a o t . e .				
B9140- 32	241	279	1.079	86	33	1	7 4	6 5	2 8 8	9	9 8	8 9	- 9	1 8	22222
B9192- 1	249	266	1.071	93	62	1	7 5	8 7	2 6 6	8	8 7	7 9	2 6	3 7	23332
B9224- 6	181	236	1.067	76	20	2	7 4	7 6	2 7 7	8	9 8	7 9	- 9	- 9	33433
B9340- 13	204	239	1.071	85	31	4	7 3	7 6	2 6 7	8	7 9	6 9	- 9	- 9	43432
B9384- 4	136	207	1.066	64	18	12	8 7	7 5	3 6 5	7	3 7	6 5	- 9	- 9	35335
WF31- 4	231	279	1.080	83	38	3	7 6	6 5	2 5 7	8	8 8	7 9	- 9	6 6	22332
WF46- 3	210	251	1.079	84	33	2	7 5	6 6	2 6 6	8	8 7	7 7	3 6	4 6	33344
WF46- 4	275	333	1.079	82	33	3	8 5	6 5	2 8 7	8	8 7	7 9	2 7	5 6	32232
Atlantic	296	346	1.080	85	38	2	8 5	7 5	2 8 7	8	7 9	7 9	1 7	5 5	23233
Belchip	313	351	1.070	89	53	3	7 6	8 8	2 3 4	8	9 7	4 9	- 9	- 9	33223
Katabdin	228	260	1.060	88	44	3	8 7	8 8	2 5 6	8	7 7	3 9	- 9	2 7	44646
Norchip	133	234	1.069	56	7	7	8 5	8 7	2 6 6	8	7 7	7 9	- 9	3 7	32243
Superior	203	243	1.066	82	30	4	7 4	7 5	4 6 6	5	7 8	8 9	- 9	- 9	45635
B9581- 3	235	278	1.067	85	54	8	7 5	7 6	2 6 7	7	5 5	5 9	2 6	1 8	23244
B9581- 10	282	317	1.066	89	58	5	7 7	7 5	2 6 7	7	7 9	6 9	2 6	1 7	33545
B9638- 11	253	313	1.077	80	27	2	7 6	8 8	2 5 5	8	5 7	3 6	- 9	- 9	34343
BR7088-18	222	275	1.070	81	23	3	7 5	7 8	2 7 6	8	7 7	5 7	- 9	2 6	22332
BR7093-23	256	302	1.064	84	41	3	6 6	9 9	2 6 8	7	9 7	5 7	- 9	3 7	22334
Islander	239	293	1.064	81	23	2	7 4	7 6	2 6 7	9	8 9	7 9	- 9	- 9	32222
Y Supreme	214	248	1.074	86	41	3	8 7	8 7	4 5 6	8	7 9	5 9	- 9	1 6	34334
Y Chipper	238	302	1.072	78	18	1	8 6	8 8	3 2 8	6	9 7	7 9	- 9	3 6	22232
NY-69	206	296	1.061	69	13	6	7 5	8 7	3 7 5	8	8 9	7 5	- 9	2 8	65766
NY-71	197	246	1.065	80	18	2	7 6	7 7	2 7 7	6	9 9	7 9	- 9	2 8	52333
NY-72	257	310	1.076	82	32	1	8 8	7 7	2 7 7	8	9 8	7 9	- 9	- 9	22323
Grand Mean	229	279	1.071	81	33	3									
CV	21	18	4	6	30	67									
Bayes LSD.05	74	84	.004	6	13	3									

(1) All Plots were 24' long and 3' wide with 4 replications. Seed pieces were spaced 9" apart in 36" rows. Commercial cultural practices were used which included overhead irrigation. The trial was planted on April 3 and Harvest on August 13. This field has had potatoes in it since 1981.

New Jersey Table 4. Continued

	Market Cwt/A	Total Cwt/A	Spec. Grav.	Percent Over 1 7/8 2 1/2	% Cull	M A a P t	C o T l e x r T	S D h e A p t p e h .	E y e	S G e r c . G C r r	S H . t S . e S t p	H H R N a o t . e	H N R N a o t . e	Chip Color	
Conestoga	354	419	1.071	85	47	8	5 4	8 7	2 5 5	6	7 5	6 9	4 6	- 9	3333
Hudson	321	355	1.070	91	66	5	7 8	8 8	2 6 6	7	8 5	6 9	- 9	- 9	5656
Islander	383	453	1.074	85	32	2	7 5	8 6	3 5 6	5	8 7	7 9	4 6	- 9	2242
Jemseg	316	369	1.067	86	70	12	5 5	8 7	3 6 6	7	8 4	8 9	4 6	- 9	3545
Katahdin	390	419	1.064	93	68	1	7 8	9 8	2 5 6	8	8 7	5 9	1 7	1 8	4556
Norchip	335	395	1.075	85	35	4	3 4	9 8	2 7 6	6	7 7	6 9	- 9	2 7	3443
Rosa	312	377	1.066	83	32	3	4 7	9 9	2 7 7	8	7 9	2 9	2 7	1 7	2435
Simcoe	404	421	1.074	96	65	0	5 5	8 8	2 7 8	8	9 9	7 9	1 8	6 6	2333
Superior	441	482	1.069	92	58	4	6 5	7 5	5 6 6	4	8 6	8 9	- 9	2 7	4544
Y Supreme	430	471	1.075	91	65	4	6 7	8 8	3 3 5	6	6 6	3 9	8 3	1 8	4335
Y Chipper	331	401	1.076	82	22	2	6 7	8 8	2 6 7	7	9 9	6 9	1 8	1 8	2546
B9140- 32	383	408	1.076	94	43	0	4 5	7 5	2 8 8	7	9 8	7 9	2 7	2 7	1232
B9192- 1	377	401	1.068	94	69	2	4 4	8 8	3 7 7	6	9 7	5 8	6 5	3 7	1544
Denali	303	348	1.085	87	43	3	7 8	8 7	4 7 7	7	8 8	4 9	7 4	- 9	4345
Grand Mean	347	396	1.070	88	47	4									
CV	15	15	5	4	15	69									
Bayes LSD.05	72	87	.004	5	9	4									

(1) All Plots were 24' long and 3' wide with 4 replications. Seed pieces were spaced 9" apart in 36" rows. Commercial cultural practices were used which included overhead irrigation. The trial was planted on April 28 and Harvest on August 22. This field has not had potatoes in it in recent years.

New Jersey Table 5. Yields, Specific Gravities, Tuber Sizes, Plant and Tuber Ratings for 20 Entries Grown on a Sandy Loam on the Farm of Edgar Maghan near Freehold, NJ 1984. (1)

	Market Cwt/A	Total Cwt/A	Spec. Grav.	Percent Over		% Culls	M A p t	C o l e x r	S D h e A p t p e h	E y e	S G e r c G C r r	S H . t S . e S t p	H R N a t o t e	H R N a t o t e
			4 oz	10 oz										
ND388-1 ND534-4 WF564-3 Acadia Rus	166	185	1.084	89	42	6	8 6	4 2	8 7 7	8	9 6	8 9	3 7	- 9
	77	92	1.082	84	34	6	8 8	5 4	9 6 8	7	7 9	8 9	- 9	- 9
	300	350	1.080	88	38	9	8 7	5 4	7 7 7	5	7 5	8 9	4 7	- 9
	110	162	1.071	75	39	18	9 7	5 4	5 5 4	6	8 9	6 9	- 9	- 9
Agassiz Alaska Rus Belrus Goldrus	136	158	1.075	85	19	3	9 9	5 3	8 7 6	7	9 9	6 9	1 8	- 9
	197	221	1.084	88	31	5	8 7	6 6	5 6 5	6	9 9	8 9	2 7	- 9
	149	177	1.084	83	47	10	8 6	4 2	8 5 6	6	8 9	8 9	- 9	- 9
	146	173	1.084	85	31	3	8 5	5 3	7 8 7	8	9 7	9 9	4 6	- 9
R Burbank Superior Belrus Russette	106	132	1.079	81	24	7	8 8	5 4	9 8 4	5	2 4	9 9	4 7	- 9
	281	293	1.075	96	46	2	8 5	7 7	3 7 7	4	8 9	9 9	- 9	- 9
	163	225	1.078	80	38	3	8 6	4 2	8 5 7	8	7 9	8 9	- 9	- 9
	218	234	1.078	93	30	2	8 9	4 2	3 6 5	8	9 9	9 9	4 6	- 9
B9398- 2 B9399- 1 B9540- 24 B9540- 62	217	235	1.080	92	21	2	7 5	4 2	7 6 6	8	9 9	8 9	5 6	- 9
	74	84	1.067	87	22	1	8 5	5 4	8 7 5	8	9 9	7 9	5 6	- 9
	220	237	1.070	93	46	1	8 7	4 3	8 6 7	8	7 9	7 9	8 5	- 9
	253	271	1.066	94	54	2	8 5	4 3	8 8 8	8	7 9	8 9	7 5	- 9
B9553- 6 B9569- 2 B9596- 2 B9648- 9	336	378	1.065	89	50	8	8 4	5 5	6 7 6	7	6 6	7 9	- 9	- 9
	294	322	1.070	91	37	2	8 4	4 2	7 7 6	8	6 9	7 9	1 7	- 9
	134	152	1.059	88	57	6	8 5	5 4	8 7 7	6	9 9	6 9	- 9	- 9
	194	218	1.054	89	47	3	8 5	5 3	8 8 7	8	9 4	5 9	4 6	3 6
Grand Mean	182	207	1.073	87	37	6								
CV	21	22	13	12	26	162								
Bayes LSD.05	50	59	1.015	20	14	0								

(1) All Plots were 12' long and 6' (2 rows) wide with 4 replications. Seed pieces were spaced 9" apart in 36" rows. Commercial cultural practices were used which included solid set overhead irrigation. The trial was planted on April 27 and harvested on September 27. This field has had potatoes in it every other year.

New Jersey Table 6. Yields, Specific Gravities, Tuber Sizes, Plant and Tuber Ratings for 14 Entries Grown on a Sandy Loam on the Charles A. Flock & Sons Farm near Colts Neck, NJ 1984. (1)

	Market Cwt/A	Total Cwt/A	Spec. Grav.	Percent Over		% Culls	M A P t	C o T l e	S D h e A	E y e	S G e r c .	S H . t S .	H H		H N	
				1 7/8	2 1/2		A P t	r T	a p p t p h .	y e	r r	e s t p	R N a o t . e	R N a o t . e	R N a o t . e	R N a o t . e
Caribe	253	282	1.075	90	21	5	4 4	1 8	5 6 6	7	7 7	5 9	- 9	- 9	- 9	- 9
Erik	417	441	1.060	94	40	2	4 3	2 7	5 5 7	6	9 7	3 9	- 9	- 9	1 8	1 8
Norland	230	253	1.052	91	15	3	2 2	2 8	2 8 8	7	6 9	5 9	- 9	- 9	- 9	- 9
R Pontiac	370	410	1.055	90	37	4	5 5	2 7	3 5 5	4	4 7	4 9	1 7	1 7	2 6	2 6
Redsen	232	269	1.064	87	15	2	2 2	2 8	1 8 8	7	9 9	5 9	1 7	1 7	2 7	2 7
Rhine Red	346	359	1.068	93	60	1	7 7	2 6	3 5 7	6	9 9	5 9	- 9	- 9	1 7	1 7
Superior	266	273	1.070	94	37	1	6 4	6 5	4 6 7	4	9 9	8 9	- 9	- 9	3 7	3 7
Islander	375	412	1.069	91	28	1	6 5	7 6	4 6 8	9	8 9	7 9	4 6	4 6	- 9	- 9
Y Supreme	420	462	1.082	91	47	5	6 7	8 8	2 7 6	5	9 7	6 9	4 5	4 5	3 7	3 7
Y Chipper	280	325	1.079	86	23	5	6 5	7 7	3 7 7	7	9 6	9 9	2 6	2 6	2 8	2 8
B9140- 32	321	339	1.082	94	23	1	7 4	7 6	1 8 9	8	9 9	7 9	1 7	1 7	2 8	2 8
B9540- 62	243	273	1.071	86	11	1	4 5	5 5	7 6 7	7	8 9	7 9	1 7	1 7	2 7	2 7
BR7088-18	274	300	1.080	91	33	5	6 6	6 7	3 7 7	6	7 6	7 9	2 7	2 7	3 6	3 6
BR7093-23	348	368	1.067	94	49	2	6 8	8 8	3 7 7	8	8 9	6 9	2 7	2 7	6 7	6 7
Grand Mean	294	322	1.070	91	30	3										
CV	20	19	.8	4	35	75										
W-D Bayes LSD.05	87	90	.007	6	14	3										

(1) All Plots were 12' long and 6' (2 rows) wide with 4 replications. Seed pieces were planted 9" apart in 36" rows. Commercial cultural practices were used which included overhead irrigation. The trial were planted on April 14 and harvested on August 30.

NEW YORK - LONG ISLAND

J. B. Sieczka, R. C. Neese, and D. D. Moyer

General Information	Nine replicated variety evaluations, three seedling observational trials, six fertilizer rate x spacing studies and four fertilizer experiments were conducted on Long Island in 1984. The results of these experiments are included in this report.
North Fork White	Sunrise, A73-1, A73-26, C7719-6, and NY-76 had yields greater than Superior in an early maturity trial. Yields of the main season clones Hudson, Wauseon, B7592-1, B9192-1, C7523-1, NY-63, NY-64, NY-67, NY-72, NY-75 and NY-77 were equal to or greater than Katahdin. Hollow heart was a problem with Islander, Rosa, Katahdin and NY-69. Internal necrosis was noted on many lines. The advanced GN resistant lines with a tendency toward internal necrosis are B9140-32, C7523-1, NY-63, NY-64 and NY-67. Three mutant lines of Atlantic did not perform differently than the standard Atlantic with respect to yield, internal defects or specific gravity.
North Fork Russet	The highest yielding russet entries were Acadia Russet, Russette, B9164-1, B9563-2 and B9596-2. Hollow heart was a problem with GoldRus, B9164-1 and WF564-3 and a potential problem with B9398-2 and B9540-62. Internal quality was also a problem in Alaska Russet, Russet Burbank, B9563-2, ND388-1, and ND534-4.
North Fork Red	Chieftain and Rhine Red were the best yielding red varieties but Rhine Red had deep eyes and irregular shape. Redsen was extremely attractive but the yield was low.
South Fork	Most varieties produced yields greater than Katahdin. Exceptions were Islander, Rosa, Wauseon and NY-67. NY-64 produced the highest yield. Other high yielding lines included B7592-1, C7523-1, NY-63, NY-72, NY-76 and NY-77. Acadia is the only russet line that did well. Hollow heart was a major problem with GoldRus.
Spacing x Nitrogen Rate	Nitrogen rates greater than 110 lb/A increased yield of BelRus, GoldRus, Sunrise (C7358-14), Rosa and Wauseon. Entries which did not respond to increasing nitrogen rate are Yankee Chipper, C7523-1, NY-63 and NY-73. Within row spacing of 15 inches increased marketable yield and size of BelRus tubers.

Long Island Table 1. Results of Early White Potato Variety Trial, Riverhead, NY, 1984.

Clone ^{1/}	Yield (cwt/A)		% of Sup. 2-4"	% ^{2/} Def.	Int. Def. ^{3/}				Spec ^{4/} Grav.	Vine ^{5/} Mat.	App ^{6/}
	Total	US No. 1 2-4"			Int. Nec.						
					HH	SL	M	S			
Islander	313	211	79	2 (M)	18	-	-	-	70	7.3	7.0
Onaway	412	319	119	9 (M,G)	2	-	-	-	62	5.8	6.0
Superior	330	268	100	4 (M)	2	-	-	-	64	4.8	7.0
A73-1	407	362	135	3 (M,G)	4	-	-	-	60	3.8	7.0
A73-26	434	324	121	0	3	-	-	-	66	6.8	7.2
C7358-14	375	313	117	2 (M)	-	2	-	-	64	3.3	7.0
C7719-6	356	295	110	5 (S,M)	-	-	-	-	56	4.3	7.5
C7722-19	277	196	73	8 (M)	-	-	-	-	59	4.3	6.2
NY-69	375	293	109	1 (S)	10	-	-	-	62	6.3	7.0
NY-71	297	250	93	1 (M,G)	-	-	-	-	63	4.1	7.0
NY-74	304	233	87	1 (M)	3	-	-	-	71	2.0	7.0
NY-76	445	367	137	2 (M,S)	5	3	-	-	68	7.3	7.0

Waller-
Duncan (0.05) (45) (43) (3)

- ^{1/} Planted April 13, 1984, rotobeat August 14, 1984, harvested August 15, 1984. Within row spacing 9.3". Fertilizer applied at a rate of 1000 lb/A of 8-20-16-4 (MgO) in bands at time of planting, 80 lbs of N sidedressed. Plot size 2 rows x 12 feet, 4 replications.
- ^{2/} Defects = Total of all defects. Letters in parenthesis are abbreviations for major defects, S = sunburn, M = misshapen, G = growth cracks, L = prominent lenticels, Sc = scab.
- ^{3/} Number of tubers with hollow heart (including brown center) or internal necrosis of 40 tubers cut (10 per replication), Sl = slight, M = moderate, S = severe.
- ^{4/} Specific gravity determined by hydrometer. 1.0 omitted.
- ^{5/} Vine maturity rated on August 13, 1984 on a scale of 1 to 9; 1 = completely dead, 9 = green and vigorous.
- ^{6/} Appearance - rated on a scale of 1 to 9; 1 = extremely rough, unattractive, 9 = smooth, attractive.

Long Island Table 2. Results of Advanced Golden Nematode Resistant Clones Experiment, Riverhead, N.Y., 1984.

Clone ^{1/}	Yield (cwt/A)		% of Kat 2-4"	% ^{2/} Def.	Int. Def. ^{3/}				Spec. ^{4/} Grav.	Vine ^{5/} Mat.	App. ^{6/}
	Total	US No.1 2-4"			HH	Int. Nec.					
						Sl	M	S			
Katahdin	385	327	100	5 (S)	7	3	1	-	71	4.0	7.0
Superior	337	261	80	4 (M)	1	7	-	-	71	1.3	6.7
B7592-1	458	385	118	5 (M)	3	6	1	-	72	5.0	7.0
B9140-32	347	288	88	2	1	15	4	4	79	3.0	7.3
B9192-1	380	332	101	2	2	3	2	1	68	2.0	7.0
B9340-13	247	156	48	2	9	1	1	-	74	1.0	7.3
B9384-4	223	150	46	3	1	-	-	-	67	1.0	7.3
C7523-1	422	324	99	3	-	6	5	1	68	4.7	7.3
NY-63	433	360	110	8 (S,G)	3	9	3	3	72	6.7	7.3
NY-64	460	257	78	13 (S,G)	-	8	1	1	74	3.7	7.0
NY-67	459	394	120	3	-	9	2	1	79	7.7	7.0
NY-72	523	463	141	1	4	1	-	1	82	4.3	6.7
NY-75	404	337	103	5 (G)	-	6	1	-	81	4.7	6.7
NY-77	467	404	123	2	2	4	2	-	78	4.7	7.7
Waller- Duncan (0.05)	(55)	(60)							(3)		

1/ Planted April 13, 1984, vine killed September 7, 1984, harvested October 3, 1984, plot size 1 row x 20 ft, 3 replications. See footnote 1, Table 1.

2/-6/ See appropriate footnotes, Table 1.

3/ 30 tubers cut.

5/ Rated August 28, 1984.

Long Island Table 3. Results of NE-107 Main Season Variety Experiment, Riverhead, N.Y., 1984.

Clone ^{1/}	Yield (cwt/A)		% of Kat 2-4"	% ^{2/} Def.	Int. Def. ^{3/}				Spec. ^{4/} Grav.	Vine ^{5/} Mat.	App. ^{6/}
	Total	US No.1 2-4"			Int.Nec.						
					HH	S1	M	S			
Hudson	498	338	104	26 (L,S,G)	7	10	-	-	75	6.0	5.5
Islander	350	272	84	3 (M)	19	15	3	2	76	6.5	7.0
Katahdin	395	326	100	6 (S,M)	10	11	-	-	72	5.8	7.5
Rosa	277	192	59	7 (S,Sc)	17	2	1	-	70	4.0	6.8
Superior	361	292	89	8 (S,M)	1	8	-	-	70	2.0	6.8
Yankee Chipper	329	216	66	12 (S,G)	4	8	4	-	84	4.5	7.0
Wauseon	404	324	99	9 (S,M,G)	9	3	1	-	68	3.5	6.2
AF236-1	375	261	80	18 (S,L)	-	7	3	1	84	7.3	6.2
AF330-1	346	246	75	11 (Sc,S,G)	8	3	-	-	76	4.0	6.2
CF76136-1	297	166	51	17 (M,G)	-	8	1	-	70	3.0	6.2
NY-63	450	355	109	14 (L,S,M)	5	10	7	2	68	5.8	6.8
NY-64	447	310	95	20 (Su,G)	-	9	3	-	74	4.8	7.2
Waller-Duncan	(38)	(45)							(3)		

1/ Planted April 13, 1984, vine killed Sept. 7, harvested Sept. 28, 1984.

1/-6/ See appropriate footnotes, Table 1.

5/ Rated August 28, 1984.

Long Island Table 4. Results of NE-107 Russet Experiment, Riverhead, NY, 1984.

Clone ^{1/}	Yield (cwt/A)		% of BelRus 4-16	% ^{2/} Def.	Int. Def. ^{3/}				Spec. ^{4/} Grav.	Vine ^{5/} Mat.	App. ^{6/}
	Total	US No.1 4-16			Int. Nec.						
					HH	Sl	M	S			
Acadia	403	328	465	4 (M)	4	5	-	-	72	6.8	7.5
Agassiz	169	89	126	6 (M, G)	2	2	1	-	66	2.8	6.5
Alaska Russet	226	123	174	3 (M, Sc, G)	11	10	-	-	74	2.3	6.8
BelRus	99	70	100	4 (M)	3	3	-	-	73	2.0	6.8
GoldRus	210	128	181	15 (M, Sc)	28	3	2	-	65	2.0	6.2
Russet Burbank	352	201	285	33 (M)	15	17	-	-	79	7.3	4.8
C7789-1	270	207	294	11 (G, S)	3	9	-	-	64	2.0	6.6
MN9319	308	218	310	8 (G, M)	-	3	-	-	64	2.8	8.0
ND388-1	292	218	310	4 (M)	15	14	5	-	75	2.5	7.5
ND534-4	288	197	280	11 (Sc, L, M)	10	7	-	-	69	2.0	7.2
NY-73	252	144	203	10 (Sc, M)	3	5	-	-	71	3.8	6.8
WF564-3	371	250	355	8 (M, G)	17	3	-	-	66	3.0	7.5
Waller-Duncan	(61)	(60)							(3)		
	(0.05)										

Long Island Table 5. Results of USDA Russet Experiment, Riverhead, NY, 1984.

Clone ^{1/}	Yield (cwt/A)		% of BelRus 4-16 oz	% ^{2/} Def.	Int. Def. ^{3/}					Vine ^{4/} Mat.	Spec. ^{5/} Grav.	App. ^{6/}
	Total	US No.1 4-16 oz			Int. Nec.							
					HH	BC	S1	M	S			
BelRus	147	103	100	4 (M)	-	1	-	-	-	1.5	74	7.8
GoldRus	196	114	111	10 (M)	31	-	-	-	-	1.3	70	6.8
Russette	389	200	194	30 (Sc, G)	10	-	-	-	-	5.5	80	7.0
B9164-1	289	223	216	6 (S, M)	28	-	2	5	-	5.8	66	7.7
B9398-2	148	88	86	10 (M)	13	-	1	-	-	2.8	76	6.8
B9400-5	226	153	148	2	-	2	1	1	-	1.5	68	7.5
B9540-55	198	122	119	8 (M)	4	-	3	7	7	2.0	61	6.8
B9540-62	256	185	180	5 (M)	12	1	1	-	-	2.3	69	7.3
B9553-6	294	181	176	10 (G, M)	1	-	9	2	-	2.0	65	7.5
B9563-2	442	342	332	5 (G, M)	4	3	8	4	1	7.0	76	8.3
B9569-2	225	135	131	8 (G, M)	2	2	3	-	-	1.8	70	7.3
B9596-2	344	284	275	2	-	-	3	3	1	2.8	67	8.8
B9606-12	221	128	125	1	8	-	5	-	-	2.5	78	7.8
B9648-9	192	84	81	25 (G)	8	-	-	-	-	1.5	62	6.8
B9720-3	186	110	107	5 (M)	4	4	1	-	1	1.5	73	7.5
B9752-7	330	202	196	6 (S)	7	-	5	3	1	1.5	69	7.8
Waller-Duncan (53)	(48)										(4)	
(0.05)												

1/ Planted April 13, 1984, vine killed September 7, 1984, harvested October 3, 1984.
Plot size 1 row x 20 ft, 4 replications. See Table 1, footnote 1.

2/-6/ See appropriate footnotes, Table 1.

5/ Rated August 28, 1984.

Long Island Table 6. Results of Red Variety Trial, Riverhead, N.Y., 1984

Clone ^{1/}	Yield (cwt/A)		% of Norland 2-4"	% ^{2/} Def.	Int. Def. ^{3/}				Spec ^{4/} Grav.	Vine ^{5/} Mat.	App ^{6/}
	Total	US No.1 2-4"			Int.Nec.						
					HH	S1	M	S			
Chieftain	330	255	197	4 (G)	-	8	7	-	68	2.0	7.5
Erik	309	208	160	14 (G,M)	-	-	-	-	63	1.7	6.8
Norland	193	129	100	2 (G)	-	9	-	-	59	1.0	6.8
Redsen	208	136	105	1 (G)	-	2	-	-	63	1.3	8.5
Rhine Red	320	254	187	6 (G,M)	-	-	-	-	77	5.0	6.0
Waller-Duncan (0.05)	(35)	(55)									

1/ Planted May 2, 1984, vine killed September 7, 1984, harvested September 20, 1984, three replications. See Table 1, footnote 1.

2/-6/ See appropriate footnotes, Table 1.

3/ 30 tubers cut.

5/ Rated August 28, 1984.

Long Island Table 7. Results of an Internal Necrosis Study of Atlantic Selections, Riverhead, NY, 1984.

Clone ^{1/}	Yield (cwt/A)		% ^{2/} Def.	Int. Def. ^{3/}					Spec. ^{4/} Grav.	Vine ^{5/} Mat.	App. ^{6/}
	Total	2-4"		HH	BC	Int.Nec.					
						Sl	M	S			
Atlantic	404	339	3 (G)	19	-	42	26	8	89	4.3	6.8
WF31-4	322	250	5 (G)	10	-	41	10	1	88	4.8	6.5
WF46-3	343	294	1 (G)	11	-	38	19	17	88	3.7	6.8
WF46-4	353	298	1 (G)	10	-	49	23	4	88	4.4	7.0
Sign Level	(ns)	(ns)							(ns)		

1/ Planted 5/3/84, vine killed 9/7/84, harvested 9/27/84. Plot size 1 row x 15 feet, 4 replications. See footnote 1, Table 1.

2/-6/ See appropriate footnotes, Table 1.

3/ Forty tubers were cut in each replication, 20 from the 2-2½ and 20 from the 2½ - 3¼ categories. The numerals in the table are the total number of tubers with defects of the 160 tubers cut/clone.

5/ Rated August 28, 1984.

Long Island Table 8. Results of South Fork White Variety Trial, Sagaponack, NY, 1984.

Clone ^{1/}	Yield (cwt/A)		% of Kat.	% of Total Yield Def ^{2/}		Int. Def. ^{3/}					App. ^{4/}
	Total	US No. 1 >2				Int. Nec.					
						HH	BC	SI	M	S	
Hudson	366	297	138	81	9(M)	4	6	5	-	-	7.0
Islander	211	138	80	65	3(M)	10	-	5	-	-	7.0
Katahdin	266	181	100	68	5(S)	1	1	-	-	-	8.0
Rosa	194	108	73	56	8(S)	2	1	4	-	-	7.3
Superior	304	213	114	70	5(M)	2	-	4	-	-	6.7
Wauseon	171	98	64	58	8(S)	4	4	-	-	-	7.0
Yankee Chipper	317	211	119	67	5(M)	5	1	2	-	-	7.7
B7592-1	441	347	166	79	6(S)	2	1	4	1	-	7.0
C7358-14	317	237	119	75	4(S)	1	1	1	-	-	7.7
C7523-1	418	288	157	69	5(S)	1	1	1	-	-	8.0
NY63	382	316	144	83	2(M)	4	-	7	1	-	7.7
NY64	541	389	204	72	10(G)	1	1	7	-	-	7.0
NY67	252	181	95	72	2	1	-	5	-	-	7.0
NY72	474	399	178	84	4(S)	-	5	1	-	-	7.0
NY74	344	224	129	65	3(G)	1	-	-	-	-	8.0
NY75	329	261	124	79	2	-	-	-	-	-	7.0
NY76	459	383	171	83	4(S)	-	1	4	1	1	7.0
NY77	448	368	169	82	4(S)	2	1	4	-	-	7.3
Waller-Duncan (0.05)	(80)	(69)									

Long Island Table 9. Results of South Fork Russet Variety Trial, Sagaponack, NY, 1984.

Clone ^{1/}	Yield (cwt/A)		% of BelRus 4-16 oz	% of Total Yield					Def. ^{2/}	Int. Def. ^{3/}				App. ^{4/}
	Total	US No. 1 4-16 oz								Int. Nec.				
										HH	SI	M	S	
Acadia	281	140	158	29	12	9	5	5	2	4	-	-	7.7	
BelRus	190	88	100	39	7	-	-	1	2	2	-	-	8.0	
GoldRus	102	31	35	30	-	-	-	12 (M)	15	-	-	-	7.0	
MN9319	216	77	87	25	10	-	2	13 (M)	2	-	-	-	7.0	
NY73	190	82	93	38	3	2	-	2	1	1	-	-	8.0	
Waller- Duncan (0.05)	(63)	(63)												

^{1/} Planted April 27, 1984, harvested October 18, 1984. Fertilizer applied at a rate of 2,200 lb/A of 8-16-8 in bands at time of planting. Plot size 2 rows x 12', 3 replications.

^{2/4/5/} See appropriate footnotes, Table 1.

^{3/} Number of tubers with internal defects of 30 cut. See Table 1, footnote 3.

Long Island Table 10. The effect of nitrogen rate and spacing on yield and quality of four russet potato clones.

Clone ^{1/}	N Rate ^{2/} (lb/A)	Spac- ing (in.)	Yield (cwt/A)		% of Total Yield					Spec. ^{4/} Grav.
			Total	4-16	4-8	8-12	12-16	>16	Def.	
BelRus	110	12	108	55	44	7	0	0	0	77
		15	144	89	52	10	0	-	0	78
	160	12	144	89	54	8	0	0	0	79
		15	192	128	50	17	0	1	0	78
	210	12	183	128	54	12	3	1	0	78
		15	194	147	56	16	3	0	1	78
GoldRus	110	12	159	88	50	6	0	0	4 (M)	73
		15	157	92	50	9	0	0	3 (M)	72
	160	12	200	128	55	7	2	-	4 (M)	72
		15	202	147	58	12	2	0	3 (M)	76
	210	12	206	138	50	16	2	0	2 (M)	74
		15	227	148	52	11	3	1	4 (M)	74
Norgold Russet	110	9	245	139	47	8	1	0	1	68
		12	250	164	52	13	1	0	1	68
	160	9	250	167	46	20	1	0	0	66
		12	249	167	45	20	2	0	3	64
	210	9	270	179	47	17	2	-	3	68
		12	271	201	57	21	3	0	2	65
NY73	110	9	256	190	44	27	3	0	3 (G)	72
		12	245	177	48	19	4	1	5 (G)	71
	160	9	259	197	52	19	4	0	2 (G)	70
		12	265	198	55	19	1	2	3 (G)	71
	210	9	279	222	50	26	4	-	2 (G)	73
		12	274	209	47	26	4	2	1 (G)	72

^{1/} Planted 5/7/84, except NY73 which was planted 5/3/84, vine killed 9/7/84, harvested 9/20/84 except NY73, which was harvested 9/27/84. Each clone was planted as a separate experiment as a split plot with 4 reps. Nitrogen rates are main plots and spacing sub-plots. Plot size 4 rows x 20 ft, center 2 rows x 15 ft were used for data.

^{2/} All plots received 300 lb P₂O₅, 150 lb K₂O, and 50 lb MgO/A in bands at planting. Nitrogen source was ammonium nitrate.

^{3/-4/} See appropriate footnotes, Table 1.

Long Island Table 11. The effect of nitrogen rate and spacing on yield and quality of C7358-10 and C7523-1, Riverhead, NY, 1984.

Clone ^{1/}	N Rate ^{2/} (lb/A)	Spac- ing (in.)	Yield (cwt/A)		% of Total Yield				Spec ^{4/} Grav.
			Total	US No.1 2-4"	2-2½	2½-3¼	¾-4	Def.	
C7358-14	110	9	310	259	41	41	1	2(M)	69
		12	302	253	37	47	0	3(M)	70
	160	9	356	301	41	43	0	3(M)	71
		12	336	282	40	44	0	3(M)	71
	210	9	367	304	40	42	1	2(M)	73
		12	363	307	32	49	4	3(M)	72
C7523-1	110	9	446	375	43	41	0	1(M)	70
		12	433	355	42	42	1	2(M)	72
	160	9	436	375	37	48	-	1(M)	74
		12	447	376	33	50	1	2(M)	74
	210	9	452	375	40	41	2	3(M)	75
		12	460	387	34	49	1	2(M)	74

1/ Planted 5/3/84, see Table 10, footnote 1.

2/ See Table 10, footnote 2.

3/-4/ See appropriate footnotes, Table 1.

Long Island Table 12. The effect of nitrogen rate on yield and quality of Rosa, Wauseon, Yankee Chipper and NY63.

Clone ^{1/}	N Rate ^{2/} (lb/A)	Yield (cwt/A)		% of Total Yield					Spec. ^{3/} Grav.
		Total	2-4"	< 2	2-2½	2½-3¼	3¼-4	>4	
Rosa	110	226	151	33	44	23	0	0	70
	160	298	208	30	45	25	0	0	73
	210	310	216	30	40	30	0	0	74
	260	347	255	26	39	34	1	0	73
Waller-Duncan (.05)		(53)	(51)						(1)
Wauseon	110	266	218	18	46	36	0	0	69
	160	288	248	14	43	43	0	0	73
	210	334	292	13	34	53	0	0	72
	260	324	280	13	34	53	0	0	71
Waller-Duncan (.05)		(60)	(60)						(ns)
Yankee Chipper	110	172	106	38	60	2	0	0	82
	160	196	119	39	57	4	0	0	85
	210	223	135	39	56	5	0	0	85
	260	220	135	39	55	6	0	0	85
Waller-Duncan (.05)		(ns)	(ns)						(ns)
NY63	110	352	314	11	35	53	1	0	70
	160	363	324	10	34	53	2	1	71
	210	390	357	9	29	60	2	0	70
	260	389	351	10	28	58	4	0	71
Waller-Duncan (.05)		(ns)	(ns)						(ns)

1/ Rosa planted 5/7/84, others planted 5/10/84, vine killed 9/10/84. Rosa harvested 10/10/84, others harvested 10/12/84. Plot size 3 rows x 30 feet, center row x 25' used for yield data. Experimental design is a randomized complete block with 4 replications for the Rosa and NY63 experiments and 3 for Wauseon and Yankee Chipper.

2/ See Table 10, footnote 2.

3/ Specific gravity determined by hydrometer. 1.0 omitted.

Long Island Table 13. Lines worthy of future evaluation based on results of observation trials, Riverhead, NY, 1984.

Clone	Color	Tex.	Shape	Depth	App.	Spec. Grav.	Comments
Katahdin	W	RS	R-O	MT	7.8	73	Good yield
Superior	Bu	SN	O-R	MT	7.0	69	Low to moderate yield
A9-39	Bu	SN	R	MT	7.7	77	Good yield, small
AT24-9	Bu	N	R	R	8.0	78	
B9786-15	Bu	SN	O	MT	7.7	75	S1 yellow, GC, medium yield
B9786-20	W	RS	O-R	MT	7.0	79	Irr, mod. yield
B9792-1	W	SN	R	SF	7.0	75	S1 irr.
B9792-53	W	RS	R-O	MT	8.0	93	Medium yield
B9792-136	Bu	SN	O-R	MT	7.0	73	Variable size
B9792-144	Bu	SN	O-R	SF	6.0	73	Irr, good yield
B9792-194	Bu	SN	O	MT	7.0	75	Variable size
B9792-201	W	SN	R	MT	8.0	74	MDAE, small
B9914-2	T	PR	L	MT	8.0	70	Low yield, few K, GC
B9924-20	Br	MR	L-O	R	7.0	73	Small-medium

NEW YORK - LONG ISLAND

R. Loria and B. A. Kempter

- Resistance to Common Scab The resistance of potato clones to Streptomyces scabies, which induces common scab, was evaluated in naturally infested field plots at the Long Island Horticultural Research Laboratory, Riverhead, N.Y. The soil, a sandy loam, had been adjusted to a pH of about 6.0 with dolomitic limestone before planting. Ten seed tubers were planted per plot on April 30, 1984 and grown using standard commercial practices. The varieties Chippewa, Katahdin, and Superior were included in the test as standards for comparison. Plants were not irrigated during the early part of the growing season to promote infection, but precipitation was higher than normal through July. Soil moisture was therefore above what is considered optimum for infection by S. scabies.
- Plots were harvested on October 17, 1984 and up to forty tubers from each plot were washed and examined for scab lesions. Each tuber was scored for lesion type (0 = no lesions, 4 = deep pitted lesions), and surface area covered by lesions (0 = no lesions, 4 = greater than 61%). These values were used to determine individual tuber severity ratings. Severity ratings for each plot were calculated by averaging those for individual tubers.
- Four Replicate Plots Disease incidence in the plots, as indicated by percent tubers with scab, ranged from 0 to 83%; Chippewa, Katahdin, and Superior had 74, 59 and 6%, respectively (Table 1). The disease severity index ranged from 0 to 12.2; Chippewa, Katahdin and Superior had indexes of 11.7, 4.8, and 0.6, respectively. Based on the percent of tubers infected with scab, eight entries had levels of resistance similar to or greater than Superior (6%): Agassiz (4%), Rhine Red (5%), AF637-1 (6%), C7719-6 (0%), C7789-1 (7%), MN9319 (1%), ND388-1 (0%), and WF564-3 (1%).
- Two Replicate Plots Tubers infected ranged from 15 to 74% among entries; Chippewa, Katahdin, and Superior had 80, 61, and 5%, respectively (Table 2). None of the entries had scab resistance similar to or greater than that of Superior.

New York Long Island Table 1. Evaluation of clones for resistance to common scab, four replicate trial.

Clone	Lesion ^{1/} Surface Area Rating	Lesion ^{2/} Type Rating	Scab ^{3/} Severity Index	Tubers with Scab (%)
Acadia	0.9	1.9	8.7	73
Agassiz	0.0	0.1	0.2	4
Alaska Russet	0.1	0.3	0.9	12
BelRus	0.9	1.5	3.7	75
Chippewa	1.0	2.2	11.7	74
Erik	0.8	1.5	4.5	65
GoldRus	0.9	1.7	7.4	67
Hudson	0.9	1.6	5.1	72
Islander	0.3	0.7	2.9	25
Katahdin	0.6	1.4	4.8	59
Norland	0.3	0.5	1.0	24
Onaway	0.2	0.2	0.7	12
Redsen	0.2	0.3	0.6	14
Rhine Red	0.1	0.1	0.3	5
Rosa	0.7	1.2	3.5	56
Superior	0.1	0.2	0.6	6
Wauseon	0.1	0.2	0.6	9
Yankee Chipper	0.6	1.2	3.7	53
A3-5	0.3	0.6	2.0	29
A9-38	0.4	0.7	1.5	36
A73-1	0.1	0.3	0.8	13
A73-26	0.6	1.5	7.7	51
A85-8	0.2	0.4	1.3	21
AF236-1	0.2	0.3	0.8	16
AF300-1	0.9	2.1	12.2	75
AF637-1	0.1	0.2	0.5	6
AT24-9	0.2	0.2	0.5	14
AT48-21	0.2	0.4	0.8	18
B6949-WV3150	0.2	0.4	0.8	20
BR7093-23	0.3	0.8	2.5	31
BR7088-18	0.4	1.1	3.5	41
C7358-14	0.4	0.8	2.3	34
C7523-1	1.1	2.0	7.8	83
C7719-6	0.0	0.0	0.0	0
C7722-19	0.2	0.5	2.3	15
C7789-1	0.1	0.1	0.3	7
CF76136-11	0.3	0.8	2.7	34
F7300-8	0.2	0.3	0.8	19
MN9319	0.0	0.0	0.1	1
ND388-1	0.0	0.0	0.0	0
ND534-4	0.1	0.3	0.6	10
WF564-3	0.0	0.0	0.0	1
NY59	0.5	1.3	5.3	46
NY63	0.8	1.4	5.7	59
NY64	0.6	1.3	4.7	51
NY67	0.6	1.7	7.0	61

(Table continued next page)

New York Long Island Table 1. (concluded)

Clone	Lesion ^{1/} Surface Area Rating	Lesion ^{2/} Type Rating	Scab ^{3/} Severity Index	Tubers with Scab (%)
NY69	0.2	0.4	0.9	16
NY71	0.3	1.0	3.0	36
NY72	0.2	0.4	0.8	20
NY73	0.6	1.5	6.0	55
NY74	0.6	1.4	5.1	54
NY75	0.4	0.8	2.7	36
NY76	0.6	1.8	7.4	61
NY77	0.6	0.9	2.2	51

1/ 0 = no lesions, 4 = greater than 61% of tuber surface scabbed.

2/ 0 = no lesions, 4 = deep pitted lesions.

3/ Severity indexes are calculated from surface area and lesion type ratings:
0 = no scab, 140 = 61% or more of tuber surface with deep pitted scab.

New York Long Island Table 2. Evaluation of clones for resistance to common scab, two replicate trial.

Clone	Lesion ^{1/} Surface Area Rating	Lesion ^{2/} Type Rating	Scab ^{3/} Severity Index	Tubers with Scab (%)
Chippewa	1.0	2.4	11.7	80
Katahdin	0.8	1.6	6.4	61
Superior	0.0	0.1	0.2	5
B13-1	0.4	1.1	5.0	37
B14-16	0.3	1.4	4.5	48
B24-9	0.4	1.1	3.8	40
B35-39	0.2	0.3	0.7	15
B35-63	0.5	0.9	2.2	45
B35-81	0.6	1.5	5.1	59
B35-564	0.4	1.5	4.9	46
B36-20	0.4	0.9	2.0	43
BC90-3	0.8	1.5	3.3	74
BC115-3	0.3	0.4	1.1	23
BC115-6	0.2	0.5	1.0	23
BCS-166-1	0.2	0.7	2.2	24

^{1/} 0 = no lesions, 4 = greater than 61% of tuber surface scabbed.

^{2/} 0 = no lesions, 4 = deep pitted lesions.

^{3/} Severity indexes are calculated from surface area and lesion type ratings:
0 = no scab, 140 = 61% or more of tuber surface with deep pitted scab.

NEW YORK - UPSTATE

D. E. Halseth, C. A. Maatta and W. L. Hynes

Program Scope

The Vegetable Crops Department conducted 11 replicated variety yield trials in five counties in upstate New York in 1984 in which a total of 29 named varieties and 71 numbered clones were evaluated. Data from nine replicated variety yield trials conducted in five county locations is summarized in this report. Additional information on variety x nitrogen x spacing, storage and chipping research can be obtained from the authors.

Research Farm Trials

All 100 entries mentioned above, along with 25 Cornell University (R. L. Plaisted) and 31 USDA (R. E. Webb) observational clones, were evaluated at the Thompson Vegetable Research Farm at Freeville. These experiments were planted at 9" spacing on a 34" bed with 1154 lbs/A of 13-13-13 on a Howard gravelly loam. See footnotes of tables 1-5 for dates of planting, vinekill and harvest of the replicated yield trials. All of these experimental station trials were sprinkler irrigated.

Commercial Grower Trials

Six replicated variety yield trials consisting of six to 14 lines were planted with commercial potato growers in four different counties (four grower trials are in this report, Tables 6-9). Two of these trials were for evaluating tablestock clones (Tables 6 and 8) grown on muck (peat) soils and two were for chipping performance (Tables 7 and 9) from mineral soils. None of these grower trials were irrigated.

Seasonal Observations

In 1984 the season began with good temperatures and moisture for the first two weeks of planting (last week of April and first week of May). Then excessive rainfall hindered planting for the middle two weeks of May, resulting in poorer stands and/or late plantings. July and August were warm and generally drier than normal, with some of the non-irrigated grower trials being negatively affected, particularly the muck locations. September and October were also dry but temperatures were colder (3 to 4°F) than normal. As a result many clones did not reach physiological maturity, experiencing increased bruising and storage losses as well as variable chip color. Sunburn and greening were the most common defects found in the trials. Hollow heart generally was not a problem except for the one trial grown on the muck (Table 8) in Wayne County.

Promising Clones

As evaluation of lines with golden nematode (GN) resistance is our program's highest priority, a high percentage of the new numbered clones in these trials have GN resistance. Also yield, maturity, quality, storage and processing ability are other important characteristics that are measured. Round white GN resistant numbered clones which have consistently performed well are AT24-9, NY59, NY71, NY76 and B8710-1. Named white varieties with GN resistance which continue to

yield competitively are Islander, Yankee Chipper, Hampton and Rosa. Campbell 14, a GN susceptible variety, also continues to yield and chip well from 45^oF storage. Currently GN resistant named russet varieties do not exist. Acadia and Lemhi, both GN susceptible russets, have significantly higher marketable yields than Russet Burbank. However, Lemhi has a tendency for hollow heart and both varieties have variable netting on muck soils. The GN resistant russet clones B9540-62 and NY73 also have displayed very good yield potential, but they also suffer from variable russet skin set under certain conditions.

Upstate New York Table 1. NE107 Interregional Variety Trial, Freeville, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% KAT YIELD 1-7/8 -4	% OF TOTAL YIELD						DEF ^{3/}	INT ^{4/} DEF ^{4/}			SG ^{5/}	APP ^{6/}	VM ^{7/}
	TOTAL	US#1		US#1 ^{2/}					H		V	N				
		1-7/8		A	B	C	D	E								
		-4		-4												
Erik	491	458	128	1	10	55	28	1	4		0	0	0	71	6.6	3.5
AF303-5	434	407	114	3	17	52	25	0	3		1	0	0	88	6.5	7.8
NY59	432	403	113	4	15	49	30	1	1		0	0	0	83	6.4	8.3
F7300-8	470	393	110	3	12	44	27	1	13 (G)		0	0	0	83	6.3	8.8
B6949-WV3	420	379	106	3	13	49	28	0	7		0	0	0	80	5.8	5.5
Hampton	442	368	103	3	8	41	34	2	11		2	0	0	78	6.8	5.8
Katahdin	402	358	100	3	12	52	24	0	8		0	0	0	78	6.3	6.5
Islander	394	356	99	6	24	54	12	1	3		1	3	0	86	6.0	5.5
Rhine-Red	411	356	99	4	15	45	27	5	4		0	0	0	78	6.0	6.0
Campbell 14	387	349	98	4	15	54	21	0	6		1	0	0	82	6.8	6.3
Crystal	406	349	97	5	19	52	15	0	9		0	0	0	80	6.9	4.5
Monona	385	344	96	4	13	51	25	1	5		0	0	0	74	6.3	5.3
Rosa	406	344	96	8	24	51	10	0	7		1	0	0	80	6.5	5.5
Chipbelle	371	343	96	2	17	52	23	0	5		2	0	0	99	5.6	6.3
Y-Chipper	396	335	94	7	26	51	8	0	8		0	0	0	88	6.5	5.0
NY64	409	334	93	5	16	50	15	0	13 (S,G)		0	0	0	81	6.5	4.0
AF332-9	379	333	93	4	18	60	10	0	9		0	0	0	81	5.8	5.3
Belchip	401	328	92	4	11	46	24	3	11		5	0	0	87	5.3	6.3
Atlantic	414	326	91	3	11	41	27	7	11		0	0	0	93	6.4	5.8
Conestoga	342	279	78	5	16	43	23	1	13 (G)		0	0	1	85	6.3	3.0
CF72107-15	332	276	77	4	15	46	22	2	10		1	0	0	77	6.9	5.0
Waller-Duncan																
LSD (.05)	(40)	(44)												(2)		
C.V. %	7	10												2		

^{1/}Planted April 30, 1984, between row spacing 34", within row spacing 10", 1154 lbs /A of 13-13-13 applied in bands at time of planting, vines sprayed with two qt/A dinoseb + five gal/A diesel fuel on August 21, harvested August 28.

^{2/}% of total yield of various size categories. Abbreviations: A = 1-1/2 - 1-7/8", B = 1-7/8 - 2-1/2", C = 2-1/2 - 3-1/4", D = 3-1/4 - 4", E = >4".

^{3/}DEF = Total of all defects combined. Defects >8% in parenthesis with the greater defect listed first. Abbreviations: G=growth cracks, I=extremely irregular shape, K=knots from 2nd growth, S=sunburn.

^{4/}INT DEF = Number of tubers with internal defects of 40 tubers cut (10 per replication). Abbreviations: H=hollow heart, V=vascular discoloration, N=internal necrosis.

^{5/}SG = Specific gravity determined by hydrometer with 1.0 omitted.

^{6/}APP = Appearance rating based on a scale of 1 to 9; 1=extremely rough and unattractive, 9=smooth and attractive.

^{7/}VM = Vine maturity rated on a scale of 1 to 9; 1=completely dead, 9=green and vigorous. Rated on August 15.

Upstate New York Table 2. Cornell Golden Nematode Resistant Clones Trial, Freeville New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% KAT YIELD	% OF TOTAL YIELD						INT ^{4/} DEF ^{4/}			SG ^{5/} /APP ^{6/} /VM ^{7/}		
	TOTAL	US#1		A	US#1 ^{2/}					DEF ^{3/}	H	V			
		1-7/8	B		C	D	E								
		1-7/8	1-7/8		1-7/8	1-7/8	1-7/8	1-7/8	1-7/8						
AT24-9	472	430	164	2	10	52	29	2	5	0	0	0	90	6.6	6.8
B35-SG-4	457	411	156	4	16	60	14	0	6	4	0	0	88	5.9	5.0
NY59	398	365	139	7	21	57	14	0	1	0	0	0	89	6.8	8.0
Hampton	420	361	137	5	17	56	13	0	9	0	0	0	80	7.4	5.5
B24-9	387	360	137	7	27	59	7	0	1	0	0	0	85	6.9	3.3
NY72	400	359	136	6	24	56	9	0	4	0	0	0	87	7.0	5.5
NY69	397	356	135	7	29	55	5	0	4	0	0	0	73	7.4	4.3
BCS166-1	381	350	133	4	21	60	11	1	3	1	0	0	93	6.9	5.3
A85-8	382	331	126	8	28	54	5	0	6	0	0	0	81	7.5	4.0
NY67	364	330	125	8	25	56	9	0	2	0	0	0	84	7.1	7.5
BC115-3	367	325	124	9	26	55	8	0	3	1	0	0	87	6.0	1.8
NY77	355	318	121	6	26	55	8	0	5	0	0	0	83	6.5	4.3
A9-38	351	313	119	8	20	60	10	0	3	0	0	1	79	7.5	6.0
BC115-6	358	311	118	9	32	51	4	0	4	1	0	1	87	7.0	2.0
B13-1	347	309	118	7	25	55	9	1	4	0	0	0	76	5.5	3.8
Monona	335	307	117	5	20	58	13	0	3	1	0	1	79	5.6	4.8
NY64	374	305	116	8	29	46	7	0	11	0	0	0	83	6.5	3.5
A3-5	334	300	114	8	31	54	4	0	3	7	0	0	89	5.9	5.8
B35-63	355	297	113	5	20	51	13	0	11	0	0	0	86	6.1	4.0
B36-20	352	292	111	6	20	50	13	0	11	0	0	0	74	6.3	1.5
NY75	294	274	104	6	32	58	3	0	1	0	0	0	94	6.9	3.5
B35-81	320	271	103	8	25	49	11	0	8	2	0	1	87	5.1	2.3
Katahdin	300	263	100	5	17	53	18	0	8	6	0	0	79	5.6	7.0
BC90-3	251	230	87	2	10	52	30	4	2	0	0	0	78	6.8	3.8
Waller-Duncan															
LSD (.05)	(39)	(45)											(2)		
C.V. %	8	10											2		

^{1/} Planted May 1, harvested August 27, 1984. See footnote 1, Table 1.

^{2/} - ^{6/} See footnotes, Table 1.

^{7/} See footnote 7, Table 1. Rated on August 16.

Upstate New York Table 3. USDA Variety Trial, Freeville, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% KAT YIELD 1-7/8 -4	% OF TOTAL YIELD							INT ^{4/} DEF			SG ^{5/}	APP ^{6/}	VM ^{7/}
	TOTAL	US#1 1-7/8 -4		A	US#1 ^{2/}			D	E	DEF ^{3/}	H	V	N			
					B	C										
WF46-4	388	362	107	3	16	58	19	0	4		1	0	0	95	6.5	6.0
Katahdin	389	339	100	5	18	55	13	1	7		2	0	0	76	6.3	6.3
WF31-4	393	339	100	3	15	50	22	1	9		2	0	0	95	6.1	6.0
WF46-3	379	335	99	4	14	57	17	0	8		2	0	0	94	6.4	6.5
Monona	341	322	95	4	20	62	12	0	2		1	0	0	74	5.9	5.3
B9192-1	400	320	94	3	12	43	25	0	17 (G,S)		0	0	0	83	5.9	6.5
B8710-1	376	317	94	4	20	49	14	0	11 (S)		1	0	0	77	5.6	5.3
B9567-1	361	309	91	3	16	46	24	0	11 (S)		0	0	0	81	6.2	4.3
B8687-3	360	301	89	9	28	42	13	0	7		1	0	0	80	5.6	4.8
B8682-7	317	289	85	6	27	56	8	0	3		0	0	0	85	6.5	7.3
B9536-33	328	272	80	5	14	51	18	0	13 (S)		3	0	0	86	5.5	6.0
B9140-32	318	271	80	6	22	52	11	0	9		0	0	0	91	6.5	5.8
B8701-10	361	271	80	5	19	49	6	0	20 (G)		10	0	0	89	5.3	5.5
B9384-4	321	258	76	12	31	45	4	0	8		0	0	0	77	5.6	3.0
B9224-6	302	232	69	13	27	38	9	0	13 (S)		0	0	0	81	5.0	3.5
B9340-13	279	230	68	7	27	48	8	0	11 (S)		1	0	0	85	5.1	3.0
B9527-1	292	230	68	5	24	39	16	0	16 (S)		0	1	0	93	5.6	4.3
B9682-5	275	222	65	14	42	34	5	0	5		0	1	0	79	6.1	3.0
Waller-Duncan																
LSD (.05)	(51)	(58)												(4)		
G.V. %	10	14												2		

^{1/}Planted May 1, harvested August 27, 1984. See Table 1, footnote 1.

^{2/} - ^{6/}See footnotes, Table 1.

^{7/}See footnote 7, Table 1. Rated on August 16.

Upstate New York Table 4. Early Vine Maturity Trial, Freeville, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% SUP YIELD 1-7/8 -4	% OF TOTAL YIELD						DEF ^{3/}	INT ^{4/} DEF ^{4/}			SG ^{5/}	APP ^{6/}	VM ^{7/}
	TOTAL	US#1		US#1 ^{2/}												
		1-7/8 -4		A	B	C	D	E	H		V	N				
CF7523-1	490	453	134	5	22	55	16	0	2		0	0	0	83	5.5	7.5
A73-26	474	418	123	6	23	53	12	0	6		0	3	0	74	5.3	5.3
NY76	435	391	115	9	34	51	4	0	1		0	0	0	81	5.5	4.0
Caribe	430	383	113	4	21	54	14	0	7		0	0	0	77	6.4	2.5
B14-16	425	374	110	5	12	52	23	2	5		0	0	0	84	5.0	2.8
CF74135-3	429	365	108	6	20	48	17	1	9		0	0	0	69	5.3	3.0
A73-1	390	349	103	3	13	45	32	3	4		0	0	0	75	5.8	3.8
AT48-21	405	346	102	6	19	47	19	2	6		0	0	1	77	5.1	4.5
Superior	392	339	100	4	17	50	20	1	8		0	0	0	81	5.3	4.3
Norland	392	339	100	5	24	54	9	0	8		0	0	0	71	5.5	1.8
Redsen	374	338	100	9	31	53	6	0	1		0	0	0	73	6.9	2.8
NY71	384	318	94	5	15	48	20	2	11		0	0	0	82	5.4	4.8
CF7719-6	381	303	89	7	21	43	16	0	13 (S)		0	0	0	74	5.0	2.3
CF7722-19	342	301	89	6	26	49	14	0	6		0	6	2	74	5.5	4.5
NY74	364	301	89	11	37	43	3	0	6		0	0	0	94	5.4	2.3
CF7358-14	370	300	88	5	17	44	20	0	14 (S)		0	0	0	84	5.3	2.5
AF330-1	377	298	88	6	15	45	19	1	15 (G)		2	0	0	86	5.3	5.5
CF77154-10	354	296	87	6	14	48	21	0	10		0	0	0	86	4.9	3.3
Simcoe	323	293	86	4	16	62	13	1	4		0	0	0	89	6.0	5.5
Norchip	355	266	78	8	25	44	6	0	17 (G)		0	0	0	87	5.1	6.3
CF76136-11	342	258	76	11	25	45	6	0	13		0	0	0	86	5.6	4.5
Waller-Duncan																
LSD (.05)	(40)	(44)												(2)		
C.V. %	8	10												2		

^{1/}Planted April 30, 1984, between row spacing 34", within row spacing 10", 1154 lb /A of 13-13-13 applied in bands at time of planting, vines mowed off August 17, harvested August 20.

^{2/} - ^{6/}See footnotes on Table 1.

^{7/}See footnote 7, Table 1. Rated on August 15.

Upstate New York Table 5. Russet Variety Trial, Freeville, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% RB YIELD 4-16 oz	% OF TOTAL YIELD						DEF ^{3/}	INT ^{4/} DEF ^{4/}			SG ^{5/}	APP ^{6/}	VM ^{7/}
	TOTAL	US#1		US#1 ^{2/}												
		4-16 oz		A	B	C	D	E	H		V	N				
Katahdin	368	260	176	5	17	63	8	1	6		4	0	0	79	5.6	6.3
Acadia	378	252	170	4	12	44	23	11	6		3	0	0	81	4.6	7.0
NY73	334	249	169	5	11	49	25	2	8		0	0	0	84	6.5	5.0
B9400-5	331	246	166	5	13	51	24	4	5		1	0	0	77	6.5	6.3
ND534-4	323	218	148	10	18	53	15	2	3		2	0	0	81	6.5	4.8
Alaska	351	211	143	9	16	43	17	3	12 (S)		3	0	2	83	5.3	5.0
B9540-62	318	206	139	8	15	49	15	4	9		0	0	0	78	5.5	5.5
Lemhi	340	204	138	10	20	48	12	1	9		8	0	0	89	6.8	7.5
B9752-7	338	203	137	13	19	51	8	3	6		1	0	0	80	5.8	6.5
B9596-2	324	199	134	7	20	43	18	0	12		0	0	0	78	4.4	5.8
WF564-3	370	195	132	10	25	50	3	0	12 (G)		3	0	0	77	4.4	4.3
B9553-6	335	187	127	6	16	46	9	3	19 (G)		0	0	0	81	5.5	5.5
ND388-1	310	187	127	10	21	52	8	0	9		4	0	0	87	6.1	5.5
B9391-2	284	186	126	10	18	50	16	0	7		1	0	0	85	6.3	5.0
B9569-2	273	174	117	9	20	50	14	0	6		1	0	0	82	6.8	5.3
Norgold	272	169	114	8	16	44	17	1	13		1	1	0	78	5.4	5.0
BelRus	253	157	106	11	21	52	11	2	4		0	0	0	89	7.3	5.5
B9398-2	259	149	101	10	24	47	9	0	9		1	0	0	88	5.4	5.3
R-Burbank	305	148	100	15	25	38	11	1	10		6	0	0	87	4.8	8.0
GoldRus	271	145	98	12	18	44	9	0	16 (G)		2	0	0	83	6.0	4.5
Agassiz	242	142	96	15	19	50	8	0	7		1	0	0	82	6.5	3.5
B8972-1	269	141	95	10	23	47	6	0	15 (G)		9	0	0	81	6.5	5.0
B9720-3	253	131	89	16	24	49	4	0	8		0	0	0	80	6.8	5.5
B9648-9	275	116	79	12	19	30	12	0	27 (G)		0	0	0	72	7.3	6.3
Waller-Duncan																
LSD (.05)	(40)	(45)												(4)		
C.V. %	10	18												3		

^{1/}Planted May 1, 1984, harvested August 27. See footnote 1, Table 1.

^{2/}% of total yield in various size categories. Abbreviations: A = 0-2 oz, B = 2-4 oz, C = 4-10 oz, D = 10-16 oz, E = >16 oz.

^{3/} - ^{6/}See footnotes, Table 1.

^{7/}See footnote 7, Table 1. Rated on August 16.

Upstate New York Table 6. Orleans County Muck Soil Variety Trial, Elba, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% KAT YIELD B+C	% OF TOTAL YIELD					INT ^{4/} DEF ^{4/}			SG ^{5/}
	TOTAL	US#1 B+C		US#1 ^{2/}				DEF ^{3/}	H	B	I	
				A	B	C	D					
NY59	411	324	122	8	79	0	0	13 (S)	0	0	0	70
Hampton	367	275	104	11	75	0	0	14 (S)	0	0	0	65
Katahdin	344	266	100	6	77	0	2	14 (S)	0	0	0	69
Islander	324	255	96	15	78	0	0	7	0	0	0	78
NY64	350	255	96	11	73	0	0	17 (S)	0	0	0	69
Rosa	354	253	95	15	71	0	0	14	0	0	0	71
NY77	301	242	91	10	81	0	1	9	0	0	0	70
Acadia	310	209	78	19	49	18	4	9	0	0	0	71
B9540-62	325	192	72	14	50	9	2	25 (S)	0	0	0	72
Y-Chipper	298	185	70	19	62	0	0	19 (S)	0	0	0	78
NY73	318	181	68	19	42	15	2	22 (S)	0	0	0	72
Redsen	265	153	58	32	58	0	0	10	0	0	0	62
Lemhi	261	137	51	38	50	2	1	9	0	0	0	79
Norgold	260	126	47	23	38	10	2	27 (S,K)	0	0	0	63
Waller-Duncan												
LSD (.05)	(34)	(38)										(3)
C.V. %	8	13										3

^{1/}Planted June 8, harvested October 8, 1984. Within row spacing 9", between row spacing 34".

Fertilization: 900 lbs/A of 10-13-29 granular broadcast prior to planting.

Vinekill: 2 applications of 2 qts Dow General + 1 qt AG. oil.

^{2/}% of total yield of various size categories. Abbreviations: A = 0-2" for round whites, 0-4 oz for russets; B = 2-4" for round whites, 4-10 oz for russets; C = nothing for round whites, 10-16 oz for russets; D = >4" for round whites, >16 oz for russets.

^{3/}See footnote 3, Table 1.

^{4/}INT DEF = number of tubers with internal defects of 40 tubers cut (10 per replication). Abbreviations: H = hollow heart; B = brown center; I = internal necrosis.

^{5/}See footnote 5, Table 1.

Upstate New York Table 7. Steuben County Mineral Soil Variety Trial, Cohocton, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% KAT YIELD B+C	% OF TOTAL YIELD					INT ^{4/} DEF ^{4/}			SG ^{5/}
	TOTAL	US#1 B+C		US#1 ^{2/}				DEF ^{3/}	H	B	I	
				A	B	C	D					
AT24-9	419	365	177	8	87	0	2	4	1	7	0	82
NY72	424	358	173	6	84	0	2	8	0	0	0	77
NY76	391	320	155	17	82	0	0	1	0	0	0	74
NY71	348	311	150	7	89	0	1	3	0	0	0	78
NY74	402	288	139	22	72	0	0	6	0	0	0	86
Acadia	349	262	126	13	49	26	4	8	0	3	0	75
NY75	337	257	124	11	77	0	0	11 (S)	0	0	0	87
Lemhi	336	247	119	17	60	13	1	9	3	0	0	81
AT48-21	304	235	114	12	77	0	1	10	0	0	0	77
Katahdin	253	207	100	10	82	0	0	7	1	0	0	75
NY73	263	195	94	13	58	16	1	13 (S)	0	0	0	80
Monona	262	188	91	16	71	0	0	13 (S)	0	0	0	73
Norgold	258	181	87	13	53	17	0	17 (K,S)	4	0	1	74
B9540-62	244	162	78	21	46	20	0	13 S	1	0	0	77
Waller-Duncan												
LSD (.05)	(58)	(57)										(6)
C.V. %	11	14										4

^{1/} Planted June 2, harvested October 4, 1984. Within row spacing 9", between row spacing 36". Means and analysis of variance based on three replications only. The fourth replication was lost due to drainage problems.
Fertilization: 1150 lbs/A of 10-10-12 applied at time of planting.
Vinekill: 2 pt/A Dinitro applied on August 28.

^{2/} - ^{5/} See footnotes, Table 6. Thirty tubers examined for internal defects (10 per replication).

Upstate New York Table 8. Wayne County Muck Soil Variety Trial, Savannah, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% KAT YIELD B+C	% OF TOTAL YIELD					INT ^{4/} DEF ^{4/}			SG ^{5/}
	TOTAL	US#1 B+C		US#1 ^{2/}				DEF ^{3/}	H	B	I	
				A	B	C	D					
NY72	559	485	136	6	87	0	2	6	6	0	0	66
NY77	514	430	120	7	84	0	1	8	4	0	0	67
NY59	460	399	112	4	87	0	5	4	7	0	0	68
AT24-9	515	380	106	5	73	0	1	21 (G)	8	0	0	78
NY71	425	363	102	5	86	0	4	5	8	0	1	67
A85-8	419	359	101	12	85	0	0	3	3	0	0	69
Katahdin	445	357	100	5	80	0	2	13 (S,G)	9	0	1	66
Hampton	474	349	98	8	73	0	1	18 (G,S)	15	0	0	66
NY67	446	348	97	7	78	0	6	9	4	0	0	62
NY69	433	347	97	15	79	0	0	6	0	0	0	61
Acadia	431	324	91	13	56	19	5	7	10	0	0	72
A73-1	353	317	89	9	89	0	0	2	7	1	1	62
NY74	397	313	88	19	79	0	0	2	0	0	0	79
A9-38	395	308	86	12	78	0	0	10	0	0	0	62
Islander	376	297	83	11	79	0	0	10	10	0	0	73
Rosa	417	295	83	19	71	0	0	11 (S)	2	0	0	69
NY64	383	294	82	12	77	0	0	11 (G)	2	0	0	68
Lemhi	423	293	82	19	50	19	5	6	17	0	1	70
Monona	373	285	80	10	76	0	0	14 (G)	2	1	0	62
NY76	399	285	80	22	71	0	0	7	3	0	0	68
AT48-21	328	284	80	12	86	0	0	2	5	0	0	69
Y-Chipper	377	282	79	18	74	0	0	8	1	0	0	79
A3-5	334	277	78	15	82	0	0	2	6	0	0	73
A73-26	350	260	73	19	73	0	0	8	1	0	0	62
NY75	337	260	73	15	77	0	0	8	0	3	0	71
NY73	324	243	68	21	63	12	1	3	5	0	0	66
Redsen	299	234	65	21	77	0	0	2	0	0	0	61
Norgold	271	200	56	20	54	19	3	4	2	0	2	61
Waller-Duncan												
LSD (.05)	(91)	(82)										(4)
C.V. %	16	18										5

^{1/}Planted June 7, harvested October 5, 1984. Within row spacing 9", between row spacing 32".

Fertilization: 1200 lb/A of 15-10-15 at planting.

Vinekill: one application of 2 qt/A Dow General.

^{2/} - ^{5/} See footnotes, Table 6.

Upstate New York Table 9. Wyoming County Mineral Soil Variety Trial, Hermitage, New York, 1984.

VARIETY OR CLONE ^{1/}	YIELD (CWT/A)		% KAT YIELD 2-4''	% OF TOTAL YIELD					DEF ^{3/}	INT ^{4/} DEF ^{4/}			SG ^{5/}
	TOTAL	US#1		US#1 ^{2/}				H		B	I		
		2-4''		A	B	C	D						
NY76	513	465	190	7	91	0	0	2		0	1	0	79
NY72	543	424	173	2	78	0	6	14 (S,G)		1	0	0	82
NY71	373	316	129	5	85	0	2	8		1	0	0	81
Lemhi	436	310	127	11	50	21	6	12 (S,G,K)	6	0	0		89
Acadia	483	309	126	6	36	27	24	7		1	0	0	80
Campbell 14	371	296	121	4	80	0	0	16 (S)		0	0	0	81
NY75	318	282	115	10	89	0	0	2		0	0	1	96
AT48-21	325	277	113	13	85	0	0	2		0	0	0	80
Monona	283	257	105	5	91	0	1	3		0	0	0	78
NY73	326	250	102	17	62	15	1	6		0	0	0	83
NY74	363	246	100	25	68	0	0	7		0	0	0	88
Katahdin	323	245	100	5	76	0	6	12 (S)		4	0	1	77
B9540-62	292	238	97	14	61	21	2	2		0	0	0	83
Norgold	296	218	89	22	58	14	1	5		2	1	0	78
Waller-Duncan													
LSD (.05)	(52)	(61)											(4)
C.V. %	11	15											3

^{1/} Planted June 11, harvested October 9, 1984. Within row spacing 9", between row spacing 36".

Fertilization: 2000 lbs/A or 200 gal/A 1-1-1 liquid.

Vinekill: one application of 4 qt/A Dow General.

^{2/} - ^{5/} See footnotes, Table 6.

NEW YORK BREEDING PROGRAM

R. L. Plaisted and H. D. Thurston

Crossing and Seedling Production: In 1984, 111 crosses were made for variety selection purposes. These all segregate for resistance to the golden nematode (GN). Emphasis this year was on producing clones with chipping quality and long russet clones. In germplasm development, 21 crosses were made as part of the trichome project and 426 crosses involving andigena were made. Eighty thousand transplants yielded 71,000 tubers for variety selection purposes. An additional 40,000 transplants of neotuberosum were grown in two greenhouses where they were inoculated and subsequently rogued for PVX, PVY, and late blight. These plants produced 12,000 tubers. A sample tested by ELISA revealed that roguing had eliminated all but 2% PVY and 20% PVX. Twenty acres of seedling hills produced 6,969 new clones for variety selection. Twenty four thousand seedling hills of the trichome population were grown at Ithaca, Freeville, and Riverhead. Of the 1,000 selections made on tuber yield, at present less than 20 have survived the screening for trichome density, exudate production, and quality of exudate.

Early Generation Selections: Fifteen thousand second generation clones produced 1,582 selections. An additional 215 clones were harvested as entire hills among the russet crosses. Both groups are being screened for GN resistance. Close to 70% are expected to be resistant and will be saved. In the third generation, 286 clones were saved, of which 93 chipped from 50° storage. Only 16 chipped from 45° storage. The next two generations have not been very productive. Only 9 clones have survived from the fourth generation and 4 from the fifth generation of selection.

Advanced Selections: In the sixth generation, four clones have survived two years of yield trials. All have good resistance to scab as well as GN and three are good chippers, however, their yields are not especially promising. The seventh generation contains 5 promising clones. NY78 is a midseason tablestock clone with resistance to GN, and scab, but low specific gravity. NY79 shows promise of being a GN resistant alternative to Superior. It is early maturing and has very good scab resistance. NY80 is another early clone, but low in gravity and susceptible to scab. NY81 has exceptional qualities in our experience with it for 3 years of trials. It has full season maturity, but yields as well as Superior in the early harvest trials. At full season, it has yielded 30% more than Katahdin. Its tuber size is larger than Katahdin and the gravity .008 higher than Katahdin. It chips from 50° storage and some seasons

from 45° storage with reconditioning. It has resistance to GN and scab. NY82 is a potential chipping variety with good yield and very good scab resistance. It is also resistant to GN and has a pink splash.

The eighth generation of selection is represented by four clones. NY74 chips from 50° storage and has a specific gravity .010 greater than Katahdin. It is midseason maturity and displays very rapid early growth. The total marketable yield is less than Katahdin and the tuber size is small. There are very few internal defects. It has no disease resistance except to the golden nematode. NY75 is a sibling of NY74. It also chips from 50°, but not 45°. It has better yield and tuber size, few internal defects but more pickouts due to growth cracks. It has high specific gravity and midseason maturity. It has good resistance to scab as well as to the golden nematode. NY76 produced a bright chip from 50° storage and is erratic in reconditioning from 45° storage. Yield is satisfactory, but tuber size is small. It is very free of pickouts and internal defects. The specific gravity is low. It is resistant to GN, but very susceptible to scab. NY77 is a midseason tablestock clone with good vine and tuber appearance. It has good scab and GN resistance. The tubers have a long dormancy and there is indication of problems with internal necrosis on Long Island.

In the ninth generation of selection, there are still two clones being evaluated. NY71 is a clone which has chipped well from 50° storage and 45° storage after reconditioning. The specific gravity is between Monona and Norchip. The yield, tuber size, tuber appearance, and tuber dormancy are good. It is resistant to the golden nematode and has a modest degree of resistance to scab. NY72 is a late season tablestock clone with some potential for chipping from 50° storage. It has high yields of well shaped tubers in the same size distribution as Katahdin. It has few pickouts and is free of internal defects. The specific gravity is .006 greater than Katahdin. Perhaps most remarkable is the very long tuber dormancy. This clone has good resistance to scab as well as the golden nematode.

No clones have survived from crosses made in 1973 and 1974. NY64 was produced in 1972. This is a sibling of Hampton. It is notable for its bright skin and few internal defects. The tubers are more irregular in shape and smaller in size than Hampton. It is resistant to GN and scab. It is susceptible to Verticillium wilt.

This year we are releasing NY63 as Hampton. This clone has given very good yields of spherical tubers with shallow eyes. It appears to be particularly well adapted to Long Island. It has good resistance to Verticillium wilt and the golden nematode, but is susceptible to scab. We are also releasing NY59 as Elba. This clone dates back to 1968 and has been widely tested. It consistently yields well, especially on organic soils. The tubers are oval with a flaky skin. The apical eye is medium deep. In addition to yield, it is outstanding for its combination of disease resistance. It has excellent general resistance to late blight, plus resistance to early blight, Verticillium wilt and golden nematode. It has fair resistance to scab. Its primary deficiencies are a very late vine growth that is difficult to kill and susceptibility to heat necrosis on Long Island comparable to Atlantic. Neither Hampton nor Elba can be used for chips.

Virus and Viroid Evaluation: All the clones beyond the fifth generation of selection are maintained as virus and viroid tested plants in vitro. These serve as stock plants for producing cuttings to transplant to an elite seed plot. These in turn are used to plant a seed plot which provides tubers for yield trials. All the cuttings as well as samples of seed plot tubers are evaluated by the cDNA technique for PSTV and by ELISA for major viruses. Planting large whole tubers in the seed plot promotes earlier maturity which permits earlier vine kill and keeps virus spread to a low level. All the parents used in crossing are tested for PSTV before planting and at the close of crossing. The seed lots are sampled for PSTV prior to sowing. Since we initiated this procedure using the cDNA technique, we have been free of PSTV in the variety selection program. This first generation of tubers is produced by transplanting seedlings into pots that are grown outdoors at a higher elevation where aphids are easier to control than in the greenhouses. Rapid growth allows early harvest which also contributes to fewer virus problems in this generation of tubers.

Disease Evaluations: The routine exposure trials are to the golden nematode, scab, Verticillium wilt, late blight, and early blight. The tuberosum-neotuberosum hybrids are also tested for immunity to PVY and PVX. One of the populations is screened for bacterial wilt and rootknot nematodes.

NORTH CAROLINA

F. L. Haynes

Breeding Program

Evaluations of advanced selections from the North Carolina and USDA programs were conducted at four coastal locations. Results of three trials are presented in North Carolina Tables 1, 2 and 3. The fourth location suffered from severe flooding damage early in the season and is not included here. Certain early maturing clones continued to produce superior yields and acceptable chip color.

Clonal maintenance, increase and the summer hybridization program were conducted at the Waynesville Station in the mountains. Tetraploid crosses of 22 combinations produced segregating families for evaluation. Crosses were made using the cut stem technique. A disease control test in the crossing room was continued. Metalaxyl (Ridomil) at 10 ppm in the water produced significantly more fruit set (49.6%) than water alone (31.7%) in the absence of any foliage disease. This study will be expanded.

Adaptation and Diploid Breeding

Evaluation of the adapted diploid PHU-STN population was continued at the Fletcher Station. In addition to clonal maintenance, isolated seed nurseries for each of three sub-populations were planted to produce seeds for a new selection cycle. The three seed nurseries were: 50 early blight resistant clones; 50 heat tolerant clones; and 100 high dry matter clones ranging from 19.3% to 29% dry matter. Each nursery consisted of three replications of each clone in a randomized complete block and each nursery was planted in isolation to insure pollination only among clones within the nursery. Segregating populations from each nursery will be produced in 1985 for another selection cycle.

Evaluation of resistance to early blight was continued. In addition to the seed nursery, the selected resistant clones were reinoculated and evaluated for confirmation of resistance. The resistant clones were also screened for production of unreduced gametes. Ten clones with acceptable levels of resistance and production of $2n$ gametes were identified. These were used as pollen parents in $4X-2X$ crosses which produced 4,000 tetraploid progeny. The tetraploid seedlings were inoculated and evaluated for resistance. This evaluation will be repeated in 1985 for confirmation of resistance.

The study of soft rot and blackleg resistance was continued. A field trial was conducted of clones which had been resistant in laboratory screening. Preliminary results indicate that the laboratory screening technique is reliable and can be used to identify resistant clones.

The 4X-2X hybrid program is expanding. The crosses involving high dry matter diploids have been very promising. High dry matter tetraploids from the 4X-2X crosses are being used in backcrosses to commercial tetraploids.

North Carolina Table 1. Potato trial at Cooper Farm, Tyrrell County. Plots were 1 row, 24 ft. long, 4 replications of 24 entries in RCB, 32 hills/plot. Spacing in rows, 9 inches, 40 inch rows. Fertilized 500 lb./A 24-16-16 bdcst. Planted 3/16/84, harvested 6/27/84 (102 days).

Variety	Cwt/A US#1-A	Appearance ^{1/}	Chip ^{2/} Color	S.G.	Maturity
WF46-3	364.1	8.0	3.8	1.079	Med. late
WF46-4	336.4	8.0	3.8	1.080	Med. early
73C26-1	323.9	8.0	4.5	1.069	Early
Pungo	323.2	7.0	4.3	1.068	Midseason
Atlantic	314.4	7.5	3.5	1.081	Midseason
76C29-7	311.7	7.0	3.0	1.070	Med. early
B9384-4	295.4	8.0	2.0	1.071	Early
B9340-13	293.7	8.0	3.0	1.076	Early
WF31-4	283.2	7.0	3.3	1.079	Med. late
B9192-1	272.7	7.5	2.8	1.067	Med. early
B9140-32	265.4	7.0	2.5	1.084	Med. early
Superior	264.1	8.0	3.3	1.070	Early
Islander	259.9	7.5	3.5	1.070	Med. early
Norchip	259.5	8.0	2.3	1.071	Med. early
Y. Supreme	234.4	7.0	4.8	1.075	Midseason
B9540-62	223.4	8.0			Midseason
Oceania	197.5	8.0	4.8	1.062	Very early
B9596-2	197.5	8.0			Midseason
B9569-2	187.4	7.0			Early
Y. Chipper	185.0	8.0	2.3	1.073	Early
Goldrus	176.3	8.0			Early
B9400-5	172.2	7.5			Midseason
B9398-2	164.1	8.0			Early
B9553-6	163.1	7.5			Midseason
L.S.D. (.05)	50.2				
C.V. (PCT)	13.5%				

^{1/} Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

^{2/} Chip color determined by Wise Foods, Borden, Inc., Berwick, Pa. Average of 5 samples, 1 per week for 5 weeks following harvest. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

North Carolina Table 2. Potato trial at Davis Farm, Tyrrell County. Plots were 1 row, 24 ft. long, 4 replications of 24 entries in RCB, 32 hills/plot. Spacing in row, 9 inches. Width row, 38 inches. Fertilized 1400 lb/A 10-20-20 banded. Planted 3/16/84, harvested 6/28/84 (103 days).

Variety	Cwt/A US#1-A	Appearance ^{1/}	Chip ^{2/} Color	S.G.	Maturity
73C26-1	350.5	9.0	4.3	1.055	Early
76C29-7	348.1	8.0	3.8	1.056	Med. early
Atlantic	338.8	7.0	3.3	1.068	Midseason
Y. Supreme	326.2	7.0	2.5	1.061	Midseason
Pungo	325.6	7.0	4.0	1.058	Midseason
80C42-5	313.0	7.0	3.8	1.061	Late
80C42-3	306.8	7.0	3.0	1.056	Midseason
Y. Chipper	302.5	8.0	2.3	1.060	Early
77C15-2	295.8	7.5	3.5	1.061	Med. early
80C40-5	291.6	7.0	4.3	1.054	Midseason
76C18-5	290.0	7.0	2.3	1.067	Med. early
B9336-N10	289.9	8.0	3.5	1.057	Early
Superior	287.3	8.0	3.8	1.054	Early
80C45-2	286.6	5.0			Late
76C29-1	278.2	8.0	3.8	1.049	Early
80C45-7	276.7	6.5			Late
Islander	268.4	8.0	2.3	1.058	Med. early
Norchip	263.1	7.0	2.8	1.058	Med. early
75C5-4	262.7	8.0	3.5	1.055	Midseason
80C42-8	260.7	7.5	3.8	1.061	Midseason
80C44-6	250.8	8.0	3.3	1.064	Early
80C44-11	237.0	8.0	3.0	1.074	Midseason
B9985-N1	202.2	7.5	4.8	1.049	Early
Goldrus	188.6	8.0			Early
L.S.D. (.05)	59.6				
C.V. (PCT)	14.3%				

^{1/}Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

^{2/}Chip color determined by Wise Foods, Borden, Inc., Berwick, Pa. Average of 5 samples, 1 per week for 5 weeks following harvest. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

North Carolina Table 3. Potato trial at Weeksville, Pasquotank County. Plots 1 row, 24 ft. long, 4 replications of 24 entries in RCB, 32 hills/plot. Spacing in row, 9 inches. Width row, 40 inches. Fertilized 2200 lb/A 10-10-10 banded. Planted 3/20/84, harvested 6/26/84 (98 days).

Variety	Cwt/A US#1-A	Appearance ^{1/}	Chip ^{2/} Color	S.G.	Maturity
80C45-10	371.9	8.5	4.3	1.066	Med. early
Pungo	330.8	7.0	3.8		Midseason
Atlantic	320.4	7.5	4.3		Midseason
Y. Chipper	319.0	8.0	2.8		Early
B9336-N10	305.4	7.0	4.8		Midseason
80C40-15	298.4	9.0	2.8	1.069	Med. early
73C26-1	298.3	8.0	5.3		Early
Y. Supreme	294.3	7.0	4.3		Midseason
Superior	291.0	8.0	2.8		Early
80C40-30	289.7	8.0	2.3		Early
76C18-5	286.6	8.0	3.0		Med. early
76C29-1	286.6	8.0	3.3		Early
Islander	286.4	8.0	2.8	1.063	Med. early
80C40-27	284.9	8.0	3.0	1.081	Med. early
76C29-7	280.9	8.0	3.3	1.068	Midseason
Norchip	270.0	7.5	2.8	1.070	Med. early
75C5-4	265.4	8.0	4.0		Med. early
80C38-7	236.7	7.5	3.3		Early
Oceania	217.1	8.5	3.0	1.061	Early
77C15-2	214.7	7.5	2.8		Early
Monona	185.8	7.0	2.3		Early
80C44-2	165.1	6.0	3.8		Late
77C3-2	161.9	7.0	-		Early
80C45-8	107.7	6.0	3.5		Late
L.S.D. (.05)	41.0				
C.V. (PCT)	10.6%				

^{1/}Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

^{2/}Chip color determined by Wise Foods, Borden, Inc., Berwick, Pa. Average of 5 samples, 1 per week for 5 weeks following harvest. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

NORTH DAKOTA

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Potato Breeding Program

Crossing and Seedling Production: During 1984, 414 potato crosses were made in the greenhouse. This is more than three times the number of crosses made in 1983 and this can be contributed to the excellent light and growing conditions in the greenhouse during February, March and April of 1984. Breeding procedures emphasized good processing qualities, high solids, yield, good red skin color, excellent russetting and other good horticultural characteristics. Approximately 47,000 potato seedling tubers, in which 23 percent were russeted, were produced in the greenhouse during the summer and fall of 1984. These seedling tubers will be planted in the field during the 1985 season.

From the 1983 greenhouse produced seedlings, 43,390 were planted in the field and approximately 1,200 were saved at harvest for further increase and evaluation. These seedling tubers were planted on May 8 and 9 and harvested on September 4, 5, and 6.

Advanced Selections: During the 1984 season, 865 second year selections were planted at Grand Forks on May 16 and harvested on September 11. For seed increase, the same selections were planted at Absaraka by the Plant Pathology Department. From the second year selections, 246 were saved for further evaluation and seed increase. At Grand Forks, 256 third and fourth year selections were planted in 15 hill blocks on May 17 and harvested on September 12. The same selections were planted at Casselton on May 22 and harvested on September 18 and 24. Some of these selections are also being increased by foundation seed growers at Beach, North Dakota. Of these advanced selections, 102 were saved for further increase and evaluation. In addition, named cultivars and advanced selections and breeding material from other states and provinces were planted at Grand Forks. An increase and adaptation plot was also planted again at Barnesville.

Promising Selections: The three most promising selections in the Potato Breeding Program are ND388-1Russ, ND534-4Russ and ND860-2. They are not only the most promising, but they are the three that have the largest increase in acreage of certified seed. The selection ND388-1Russ will probably be named during 1985. This blocky-oblong russet selection has good shape and type and has high yield and total solids. The selection ND388-1Russ seems to be comparable to Russet Burbank in french fry quality and it is anticipated that several french fry plants will be processing this selection within the next few years. The selection ND534-4Russ has long type and beautiful russet skin. This selection also produces higher

yields than both Norgold Russet and Russet Burbank and has high total solids. If hollow heart is not a problem, this selection should be an ideal cultivar for the count carton trade. The selection ND860-2 has excellent type and chips out of low temperature storage 38-40° F (3.3-6.1° C). This selection has Solanum phureja in its pedigree.

Other advanced selections showing promise are ND398-1, ND698-1, ND651-9, ND678-8, ND649-4R, ND1215-1, ND1323-1, and ND967-1Russ. All of these selections are also being increased by foundation seed growers at Beach, North Dakota and growers in the Red River Valley. All of these selections and several others were planted in a trial at Homestead, Florida in November, 1984 and will be harvested the last part of January, 1985. Data will be taken on their adaptability to growing conditions in the Homestead, Florida area. Several of these selections are also being tested in other trials throughout the United States and Canada.

Cultivar and Selection Trials: In 1984, cultivar trials were planted at Grand Forks, Park River, Minot, Williston and Karlsruhe, North Dakota. Due to severe dry and poor growing conditions, the trial at Williston was not harvested. The trials consisted of 25 hills grown in four replicated blocks. At Grand Forks and Park River, 25 entries were grown in trial while Minot and Williston had 11 and Karlsruhe had six entries grown in trial. For general maintenance of the trials, Wayne Grinde was in charge at Park River, while at Grand Forks Dennis Askim was in charge of trial maintenance. The trials at Minot, Williston, and Karlsruhe were handled by the station superintendents and their assistants. (North Dakota Table 1)

The North Central Regional Trial, which consisted of 20 entries, was planted at Grand Forks. In addition, another trial consisting of relatively new North Dakota, Texas and Idaho selections were also planted at Grand Forks. This trial was smaller in size--having 20 hills and only two replications.

The trial at Williston suffered severe dry growing conditions while Minot had above normal precipitation early in the year but was short in moisture from May through September. At Park River, there was ample rainfall during May and June, but almost no precipitation during July and August. This caused very hard and lumpy soil conditions at harvest time. An almost similar situation occurred at Grand Forks except there was more rainfall during July and August. In general, precipitation occurred at the beginning and the end of the season and the temperatures were quite high. For example, Grand Forks had precipitation of 4.7" in June; .9" in July and 1.8" in August.

The trial at Grand Forks had average yield of 207 cwt per acre for all entries (North Dakota Table 2), while Park River had an average yield of 177 cwt per acre. In most years, the Park River trial out-yields the Grand Forks trial; however, in 1984 the dry, hot conditions at Park River took its toll. The yield at Minot was about normal for that location. (North Dakota Table 3).

The highest yielding entries in the Red River Valley trials were Red Pontiac, ND1215-1, Kennebec and ND388-1Russ (North Dakota Table 2). Both ND388-1Russ and ND534-4Russ were higher in yield than both Norgold Russet and Russet Burbank. The selection ND1215-1, which is an oblong smooth chipping selection, was slightly higher in yield than the high yielding cultivar Kennebec. The lowest yielding entry was the Russet Burbank clone, RB5788. However, this clone was smoother, earlier, and had higher total solids than regular Russet Burbank. The selection ND860-2 also had low yield in 1984, but this can be attributed to the poor seed that was planted. At Park River and Grand Forks, several selections and cultivars produced total solids averaging above 21 percent. They were ND388-1Russ, TND22-2, ND372-2R, Norchip, ND791-5R, ND649-4R, ND651-9, ND534-4Russ, ND55-7, ND678-8, ND1086-7R, Russet Burbank, ND860-2 and RB5788. Red Pontiac, with 19.1 percent total solids, averaged the lowest in the two trials. The trial at Park River produced total solids higher than the Grand Forks trial. (North Dakota Table 2)

In the advanced selection trial (North Dakota Table 4), ND1113-10Russ and ND671-4Russ were the highest yielding entries in trial. Other high yielding entries in this trial were AT9-772598-8 and Red Norland #13. The selection ND398-1 had an average total solids of 24.0 percent and was highest in this trial.

Processing Tests - Chipping: Results from chip tests are reported in North Dakota Table 5. Samples were again stored at 38° F for approximately four months and then chipped. Following this chipping test, all samples were stored at 65° F and chipped after two weeks and four weeks of reconditioning. Several selections chipped fairly light in color out of 38° F storage. The most outstanding selection was ND860-2, which had an Agtron reading of 35.5 at Grand Forks and 31.0 at Park River. This selection continued to improve in color after reconditioning. Other selections showing good chip quality were TND22-2, ND651-9, ND55-7, ND258-1 and ND678-8. These selections were as good or better than Norchip in overall chip quality. The Park River Trial produced the lightest colored chips.

At the Processing Laboratory at East Grand Forks, Minnesota, 209 second year selections were tested for chip quality. These selections were placed in cold storage after harvest and then reconditioned at 65° F before being chipped. Several of these selections chipped over 40 on the Agtron. The third and fourth year selections were chipped out of 43° F storage and then after a period of reconditioning at 65° F. Selection ND860-2 chipped 42 on the Agtron when chipped out of 43° F and 43 on the Agtron after being reconditioned for four weeks at 65° F. Outstanding chippers were ND944-6, ND698-1, ND779-4, ND1215-16, ND862-8, ND1183-2 and ND1065-5.

Processing Tests - French Fry and Flakes: Seventeen selections and cultivars and one check sample were tested for french fry quality and nine were tested for flake quality by the Food and Nutrition Department at North Dakota State University. Processing samples were first prepared by the Processing Laboratory at East Grand Forks. Sensor scores were made for color, flavor, and texture and are reported in North Dakota Table 6.

Culinary Tests. Twenty-five selections and varieties were tested for boiling and baking when grown in trials at Grand Forks and Park River, North Dakota (North Dakota Table 7). Several selections were better than all the standard cultivars in overall boiling and baking quality.

Disease Control and Resistance Studies: One thousand second year, 150 third year and 90 fourth year and older selections were evaluated for disease and resistance to scab and silver scurf at the Potato Research Farm, Grand Forks. Approximately 1035 second year selections were grown in a potato free area (Absaraka) and evaluated for disease and horticultural characters. Approximately 240 advanced selections were grown at Casselton and evaluated for disease reactions. Approximately 500 selections from these two areas were greenhouse grown and visually indexed for tuber borne diseases. These selections, as well as parental selections, were also indexed for PVX and PVY using serology (ELISA) and spindle tuber using complementary DNA hybridization. Representative tubers of the 500 selections were grown in Florida plots for indexing of virus diseases. The disease free selections are maintained as a source of clean seed for breeding and other purposes. Selections were indexed for disease and released to growers in Beach for increase as part of the basic seed stock program. Advanced selections were tested for resistance to late blight and verticillium.

Resistance of ND534-4 Russ to PVY was studied for the second year. It appears that this is a tolerant carrier of PVY since no symptoms or yield reduction occurs when infected up to 60%, although the virus is easily detected by ELISA. The strain of PVY in 534-4 Russ cause symptoms in six other CVS, and strains of PVY from symptomatic CVS does not cause symptoms in 534-4 Russ.

Twenty advanced breeding selections were evaluated for the ability to express bacterial ring rot. Of particular note were the reactions of ND388-1 Russ and ND534-4 Russ. The selection ND 388-1 Russ displayed typical BRR symptoms in the vine but tuber symptoms were not noted or observed. No BRR symptoms were observed in either the vine or tuber for ND534-4 Russ.

North Dakota Table 1. Spacing, Fertilizer, Soil Type, Planting and Harvest Dates
of the 1984 Trial

Location	<u>Spacing</u>		Fertilizer	Soil Types	Planting		Harvest
	Row (in.)	Plant (in.)			Date	Date	
Park River	38	12	Fall application	Glyndon Silt Loam	5/7		9/10
Grand Forks	38	12	22-22-12 300 lbs./acre	Bearden Clay Loam	5/10		9/20
Minot	36	14	None	Williams Loam	5/17		9/28
Karlsruhe	36	14	138 + 14 + 152	Clontarf Sandy Loam	5/18		10/11

North Dakota Table 2. U.S. No. 1 yield, percent U.S. No. 1 and percent total solids of potato cultivars and selections grown in the Red River Valley, 1984.

Cultivar or Selection	Grand Forks				Park River				Average			
	Cwt/A		%		Cwt/A		%		Cwt/A		%	
	U.S. No. 1 Yield	U.S. No. 1	U.S. No. 1	Total Solids	U.S. No. 1 Yield	U.S. No. 1	U.S. No. 1	Total Solids	U.S. No. 1 Yield	U.S. No. 1	U.S. No. 1	Total Solids
Red Pontiac	274	91		19.7	256	93		18.4	265	92		19.1
ND1215-1	272	97		20.1	238	90		21.2	243	94		20.7
Kennebec	248	91		20.3	239	81		20.9	243	86		20.6
ND388-1Russ	257	95		22.0	218	90		22.0	237	93		22.0
ND791-5R	240	93		19.9	226	94		19.4	233	94		19.7
TND22-2	250	95		23.1	200	90		23.1	225	93		23.1
ND372-2R	230	92		21.6	217	90		22.0	224	91		21.8
ND649-4R	242	97		21.2	197	92		21.4	220	95		21.3
ND651-9	228	89		20.9	208	84		21.4	218	87		21.2
ND534-4Russ	269	92		21.2	159	83		21.4	214	88		21.3
Norchip	197	92		22.0	212	83		22.2	204	88		22.0
ND55-7	211	88		22.2	179	82		23.1	195	85		22.7
ND678-8	200	86		20.7	189	88		21.8	195	87		21.3
ND1323-1	205	88		19.4	151	84		19.9	178	86		19.6
Redsen	169	88		20.3	175	85		20.3	172	87		20.3
Norgold Russet	189	89		20.5	151	74		20.7	170	82		20.6
ND967-1Russ	196	88		19.4	124	78		19.7	160	83		19.6
ND1118-1	177	92		20.5	139	83		20.1	158	88		20.3
ND1086-7R	170	95		20.9	145	81		21.6	157	88		21.3
Russet Burbank	148	82		19.7	159	70		22.2	154	76		21.0
ND1145-13R	173	91		19.9	119	79		19.9	146	85		19.9
Norland	139	92		18.8	136	90		19.2	137	91		19.0
ND860-2	153	84		22.0	106	80		22.4	129	82		22.2
RB 5788	136	77		23.1	109	69		22.7	123	73		22.9
Average	207	90		20.8	177	84		21.1	192	87		21.0

North Dakota Table 3. Yield Data and Total Solids of
Potato Cultivars Grown at
Minot & Karlsruhe, ND - 1984^{1/}

	Total	U.S.	%	%
	Yield	No. 1	U.S.	Total
		Yield	No. 1	Solids
Minot				
Kennebec	192	173	90	22.9
Norchip	180	154	85	24.0
Norgold Russet	145	108	74	22.4
Norland	111	99	89	20.1
Red Pontiac	156	138	89	20.1
Redsen	138	121	88	21.4
Russet Burbank	151	102	67	21.8
ND372-2R	153	125	80	24.0
ND388-1Russ	180	150	83	24.0
ND534-4Russ	145	113	79	22.4
ND860-2	121	101	84	22.7
Average	152	126	82	22.3
Karlsruhe				
Crystal	422	400	95	21.6
Norgold Russet	325	301	93	19.9
Norland	307	296	96	18.2
Red Pontiac	415	402	97	19.0
Redsen	289	272	94	20.3
Lemhi	357	319	89	24.0
Average	353	332	94	20.5

^{1/} Minot is dry land, Karlsruhe is irrigated

North Dakota Table 4. Advanced Selection Trial Grown at Grand Forks,
North Dakota - 1984

Selection Number	U.S. No. 1 Yield	% U.S. No. 1 Yield	Specific Gravity	% Total Solids
ND1113-10Russ	281	90	86.3	20.9
ND671-4Russ	258	94	84.0	20.5
AT-9-772598-8	233	88	93.3	22.4
Red Norland #13	232	92	81.7	20.1
Redsen	230	89	81.7	20.1
ND1455-12	226	86	87.0	21.2
Norgold Russet M	224	78	82.7	20.3
A74114-4	221	82	91.3	22.0
Norgold Russet	216	76	83.7	20.5
Norgold Russet 35	215	74	82.3	20.1
ND1065-5	207	87	92.0	22.2
ND800-4Russ	207	88	77.3	19.0
AT-77255-7Russ	204	93	96.3	23.1
Red Viking	202	87	88.3	21.4
ND1196-2R	201	91	78.0	19.2
ND398-1	199	85	100.0	24.0
T-7-294-1Russ	196	88	96.0	23.1
Norchip	191	82	94.3	22.7
Norgold Russet 40	182	81	81.7	20.1
ND971-5Russ	181	88	96.0	23.1
ND1098-3Russ	177	76	91.0	22.0
Norgold Russet 19	173	75	81.7	20.1
ND1183-2	167	93	99.0	23.7
Red Norland #2	163	88	77.3	19.0
ND862-8	152	83	80.0	19.7
Norland	149	82	76.0	18.8
76T001-8	139	92	74.0	18.4
ND698-1	126	88	87.3	21.2
Average	198	85	86.4	21.0

North Dakota Table 5. 1984 Chip Tests of Cultivars and Selections Grown at Grand Forks and Park River - 1983

Cultivar or Selection	Agtron						Percent Chip Yield	
	0 weeks 38°F		2 weeks 65° F		4 weeks 65° F		Average 3 Tests	
	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River
Bison	11.0	13.5	23.0	40.5	47.0	47.5	29.4	29.1
Crystal	19.0	20.5	33.5	43.0	31.5	48.0	32.8	34.6
Kennebec	11.0	15.0	20.0	45.5	33.5	49.0	30.5	33.9
Lemhi	14.0	19.0	30.0	42.5	34.0	38.5	33.3	35.6
Norchip	16.0	21.0	31.5	46.5	39.5	46.0	33.5	35.8
Redsen	11.5	11.0	28.0	28.0	36.0	27.0	30.0	31.8
Russet Burbank	11.5	13.0	25.5	32.5	33.0	31.5	32.4	34.2
TND22-2	18.5	17.5	35.5	44.5	44.0	51.5	32.1	35.6
ND55-7	20.0	20.5	35.0	35.5	44.0	42.0	31.4	34.5
ND258-1	16.5	26.5	33.0	45.5	32.0	45.5	31.4	36.4
ND388-1Russ	12.0	15.0	28.5	38.5	31.5	40.5	31.6	33.9
ND392-4Russ	10.0	9.5	17.0	20.5	15.5	17.5	29.3	30.4
ND534-4Russ	12.0	13.5	24.0	34.5	23.5	33.5	31.9	34.8
ND651-9	19.0	23.0	38.0	43.0	49.0	48.5	32.3	33.8
ND678-8	12.0	15.0	23.0	38.0	42.0	45.5	31.0	32.2
ND860-2	35.5	31.0	48.0	51.5	55.0	49.0	33.4	33.9
ND9403-16R	12.0	15.5	29.5	43.0	47.0	48.5	30.3	32.1
Average	15.4	17.6	29.6	39.6	37.5	41.7	31.6	33.7

North Dakota Table 6. French Fry and Flake Tests of Potato Selections and Cultivars Grown in 1983 Trials

Cultivar or Selection	French Fry				Ranking
	Color	Texture	Flavor	Average Score	
Crystal	3.9	4.0	4.4	4.1	16
Kennebec	5.0	5.0	5.3	5.1	13
Lemhi	5.3	5.4	5.3	5.3	12
Russet Burbank	5.4	5.2	5.5	5.4	11
Viking	3.9	3.7	3.9	3.8	18
Ore Ida	6.9	6.8	6.7	6.8	4
TND22-2	8.4	6.3	5.2	6.6	6
ND258-1	8.4	6.3	6.5	7.1	2
ND388-1Russ	3.4	4.7	4.5	4.2	15
ND651-9	7.8	5.7	6.6	6.7	5
ND799-2Russ	4.4	4.6	4.4	4.5	14
ND862-8	8.7	6.5	6.0	7.1	3
ND967-1Russ	5.7	4.8	6.0	5.5	10
ND971-5Russ	3.4	4.4	4.3	4.0	17
ND1098-3Russ	5.7	5.9	5.8	5.8	8
ND1113-10Russ	5.7	5.7	5.8	5.7	9
ND1113-11Russ	8.4	6.5	6.7	7.2	1
ND1215-1	7.5	5.8	6.5	6.6	7
Flake					
Crystal	6.1	5.4	6.6	6.0	6
Lemhi	6.7	5.9	6.4	6.3	4
Norchip	6.8	6.4	6.9	6.7	1
Redsen	6.4	6.4	6.3	6.4	3
Russet Burbank	6.5	5.4	6.0	6.0	7
TND22-2	7.2	6.1	6.3	6.5	2
ND258-1	5.5	4.4	5.0	5.0	9
ND651-9	5.0	5.4	5.8	5.4	8
ND860-2	6.3	5.9	6.8	6.3	5

Rating Guide

7-9 -- Good
 5-6 -- Fair, but acceptable
 1-4 -- Poor, not acceptable

North Dakota Table 7. 1984 Cooking Tests of Cultivars and Selections Grown at Grand Forks and Park River, North Dakota - 1983.^{1/}

Cultivar or Selection	Boiling					Baking		
	Sloughing- ing ^{2/}	Mealiness ^{3/}	Color		After 5/ Cooking- ^{6/}	Mealiness	Color	Flavor
			Inmed. After 4/ Cooking	4 Hours				
Bison	9.8	4.9	8.5	6.8	6.3	4.9	7.3	6.0
Crystal	7.0	7.9	9.5	8.8	6.9	7.3	9.0	6.9
Kennebec	9.0	6.6	8.3	8.5	7.9	6.3	8.0	6.9
Lemhi	8.0	8.1	8.8	9.0	7.7	7.9	7.8	7.9
Norchip	8.8	6.5	8.0	8.0	6.6	7.0	8.5	6.0
Norgold Russet	8.3	6.4	8.8	7.3	7.7	7.1	9.3	7.7
Red Norland	9.3	6.5	7.8	6.8	7.4	5.6	7.3	7.4
Red Pontiac	8.8	5.9	9.3	8.8	7.4	5.9	8.5	6.4
Redsen	7.5	6.1	8.0	7.0	7.6	6.0	8.3	7.0
Russet Burbank	8.5	6.1	8.3	9.3	6.9	7.6	8.3	7.1
TND22-2	5.5	8.9	9.0	7.3	7.8	7.4	9.8	7.3
ND55-7	7.3	7.1	8.0	8.8	7.7	6.7	8.0	7.7
ND258-1	6.8	7.4	8.0	7.8	6.4	7.7	9.5	7.4
ND388-1Rus	7.0	7.4	6.0	6.0	7.1	7.1	7.5	7.0
ND392-4Rus	8.8	6.0	9.5	8.8	6.7	6.3	9.3	7.3
ND463-1R	9.0	6.4	8.5	6.3	7.3	6.6	8.5	7.4
ND534-4Rus	6.8	8.9	8.0	7.3	8.0	7.7	7.3	6.9
ND651-9	9.5	6.1	8.8	6.8	7.0	7.1	9.3	7.3
ND678-8	8.5	7.1	9.0	8.3	7.5	6.6	9.5	6.9
ND694-1R	9.3	5.5	7.8	8.0	7.0	4.0	7.3	6.6
ND731-6R	9.3	5.9	9.3	8.0	6.9	5.1	7.8	7.1
ND791-5R	8.8	5.1	8.5	8.0	5.9	4.4	7.3	5.9
ND860-2	8.5	7.9	5.3	4.5	6.3	7.4	9.0	7.0
ND1086-7R	8.3	5.7	8.0	7.8	6.9	6.0	6.5	7.0
ND9403-16R	9.3	5.9	8.5	9.3	7.8	5.6	7.8	5.9

^{1/} Average of two locations (Grand Forks and Park River)

^{2/} Severe Sloughing - 1; No Sloughing - 10

^{3/} Not Mealy - 1; Very Dry and Mealy - 10

^{4/} Dark - 1; Very White - 10

^{5/} Dark - 1; Very White - 10

^{6/} Poor Flavor - 1; Excellent Flavor - 10

OHIO

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Introduction

Over 90 potato varieties and advanced selection were evaluated in trials and test plots across Ohio in 1984. These trials included: (1) a statewide trial of nine entries located on six commercial farms; (2) two observation trials of 18 newer varieties, along with several older varieties for comparison, located on two of the six farms mentioned above; (3) a trial of 2 entries in replicated plots on the Ohio Agricultural Research and Development Center (OARDC), Muck Crops Branch at Celeryville; (4) an evaluation of 24 entries in the North Central Regional trials located at the OARDC campus at Wooster; (5) an evaluation of 30 entries in the Northeastern Regional Potato Variety Trials located at the OARDC campus at Wooster; (6) an evaluation of 28 advanced breeding lines in observation plots at the OARDC campus at Wooster; and (7) a trial of 18 entries in replicated plots at the Campbell Institute for Research and Technology, Campbell Soup Co., Napoleon, Ohio.

This report contains data on these various trials including chipping data (specific gravity, color and blistering) collected immediately following harvest. Additional chipping data will be available later.

Nine entries were evaluated on six commercial farms located across Ohio. These farms were selected to give different soil and climatic conditions. Six of the entries (WF 564-3, BR 7093-23, Conestoga, A 129.69-1, ND 388-1 and Acadia Russet) were included either because they looked promising in previous over-the-state trials or looked promising in the observation trials on the two farms in northeastern Ohio.

Katahdin and Norchip were included as standards. The Katahdin has been grown in Ohio for many years as a standard mid-season variety, primarily for fresh market. The Norchip variety was included as a standard for chipping tests, even though the variety has been dropping somewhat in Ohio. The Ontario was added to re-examine its potential in Ohio. This variety was tested widely in the 1950's but it was discarded due to quality problems.

The plots on the six commercial farms were grown under standard cultural and pest control practices as used on those individual farms. See Appendix Table A-1. Plots consisted of double rows approximately 40 feet long (80 seed pieces) and the entries were replicated four times. The main varieties plus some additional entries were included in the plots at Celeryville (organic soil). Stand, vigor, visible diseases, and other observations were made during the growing season.

At harvest, tubers were dug with a conventional level-bed digger, left on the soil surface to dry for approximately one hour, then were picked up by hand and weighed for total yield for the plot. A 50-pound sample was randomly selected from each replicate for grading.

Statewide-Trials

In the main trials on the six farms, Katahdin led in yield of U.S. No. 1 potatoes in four of the six farms and in the average yield on the six farms. In 1983, it led in both yield and grade in the observation trials (two farms).

Ontario led in total yield, but because of low grade, it was third in marketable yield. Katahdin was second in total yield, but as usual, it graded above average and consequently led in marketable yield.

Katahdin averaged third highest in the main trials in 1982 and 1983. It was fourth in 1981, but because W718 was omitted in 1983, it was third. A Nebraska seedling A129.69-1 was fourth in 1984 and 1983. This Nebraska seedling had highest yields in 1980 and 1981 and near the top in the observational plots in 1977 and 1978.

The stage of maturity of the nine varieties was evaluated throughout the growing season. Relative maturity is difficult to define with precision. Since Ohio is in the "borderline" of the potato growing regions in the United States, maturity may be different than found in states to the north.

The relative maturity is summarized below:

<u>Cultivars</u>	<u>Maturity</u>	<u>Approximate Days</u>
Conestoga	Very early	106
WF 564-3	Early	114
N.D. 388-1	Early	115
BR7093-23	Mid-season	125
Norchip	Mid-season	127
Katahdin	Mid-season	130
Acadia Russet	Late	140
Neb. 129.69-1	Very Late	145
Ontario	Very Late	145

Observation Trials

Eighteen entries were evaluated in observation plots on two farms in Columbiana County. Most entries were new promising lines which were evaluated previously in Ohio trials at the Ohio Agricultural Research and Development Center, Wooster, or in other observation trials in Ohio. In some instances, potato breeders in other states suggested varieties to be included in these observation plots.

In addition, observation plots were installed at the Ohio Agricultural Research and Development Center, Wooster. This plot was adjacent to the North Central and Northeastern trials discussed later.

The procedure on the observation plots on the two Columbiana County farms was approximately the same as described for the over-the-state farm plots. Plot size consisted of two rows approximately 25 feet long (50 seed pieces). Stand, plant vigor, and apparent diseases were evaluated during the growing season. Harvest procedures were the same as described earlier for the over-the-state plots. A composite sample was selected from each entry for chipping, specific gravity, and other quality tests.

The observation plots at Wooster (OARDC) were handled similar to the regional trials discussed later.

The La 01-38 was an outstanding variety at both locations with respect to yield and grade. It is a round white to slightly buff-colored skin. The maturity of this variety in these plots tended to be mid-season, but the variety in other regions is late to very late. The WNC 521-12 was the second highest yielding entry in the observation trials, but preliminary observations indicate hollow heart may be a problem.

Muck Trials

Previous research work in Ohio has shown that variety performance on organic soils may be much different than the same varieties grown on mineral soils. For example, in the 1983 Ohio trials, Belchip was one of the high yielding varieties at the Muck Crops Station, Celeryville, while experiences on mineral soils in 1982 indicated this variety was unsuitable. N.Y. 59 is another example of a variety which has performed excellently at Celeryville.

Twenty-four varieties were planted in a replicated trial, while fifty varieties were planted in single plots in an observation trial.

All plots were planted May 16, the spacing in the plots consisted of two rows (32 inches apart) and seed pieces were spaced 12 inches apart in the row. Each plot consisted of two 25-foot rows followed with a four-foot alleyway. Fertilizer was broadcast prior to planting at a rate of 860 pounds of 6-24-24 per acre. Temik was applied at planting. Plots were harvested October 2. Samples were collected for specific gravity and chipping tests by Dr. W.A. Gould, Department of Horticulture.

For some unknown reason, plant emergence was uneven. Irrigation was applied two times during the growing season. Yield of most varieties was lower than previous years. However, hollow heart (H.H.) was much less serious than 1983, for example.

N.Y. 59 continues to be one of the high yielding varieties with excellent grade of U.S. No. 1 tubers. Kennebec continues to perform quite well. BR5991-WV16 looked promising in the trials. The Belchip did not yield as well in 1984 as in the previous year; the appearance was not desirable.

North East Trials

The Northeastern Regional Potato Variety Trial (Regional Project NE 107) has been in existence for nine years. The trial is a cooperative effort among 13 states in the northeastern part of the United States and Canada. Ohio, West Virginia, and North Carolina are the most southern parts of this region while the northern extremes would be Maine and Canada. This wide area affords an opportunity to evaluate cultivars under many different soil and climatic conditions.

Potato breeders in this region offer certain lines and introductions to the cooperators in each state or province. The co-operators choose the selections for their respective tests.

Twenty-nine varieties and selections were evaluated in this NER plot at the Ohio Agricultural Research and Development Center, Wooster, Ohio. Katahdin and Superior were included as standard varieties since these varieties are commonly grown in Ohio. The other 27 selections were entries from the various breeders.

Plots were single rows, 30 feet long, and were replicated three times in a randomized complete block design. The plot was planted May 15 in excellent soil conditions. The vines were killed (with Diquat) September 4 and 11.

The fertility program consisted of 1200 pounds of 10-20-20, one-half applied as a plow-down application and the remainder applied in bands at planting time. Dual/Lexone combination was applied immediately after planting. Fungicides and insecticides were applied as suggested in the pesticide guide from the Ohio Cooperative Extension Service.

Plots were harvested September 20 and tubers were picked by hand and weighed for a gross yield per plot. A 50-pound sample was taken from each plot for grading into U.S. No. 1, B's, and culls. At grading time (November 1), tubers were also evaluated for internal and external defects. At harvest, a 20-pound sample was collected at random for specific gravity and chipping qualities. This work was done in the pilot plant in the Department of Horticulture, The Ohio State University, Columbus, Ohio, under the supervision of Dr. W.A. Gould.

The five highest yielding (gross yield) cultivars were Yankee Chipper, Acadia Russet, Islander, CF 77154-10, and Simcoe. These were followed by BR 7088-18, BR 7093-23, BR 6949-WV3, and Yukon Gold.

In the 1983 trial, Acadia Russet was a high-yielding entry but it tended to sprout in the field that year.

North Central Trials The North Central Regional Potato Variety Trial (NCR) has been conducted for 34 years. Fourteen states and two Canadian provinces (Alberta and Manitoba) are cooperating in this coordinated trial. Participating plant breeders give tubers of their most promising potato selections to cooperators who, in turn, evaluate these entries in their respective states or provinces. The states go as far south as Louisiana and as far north as Minnesota, North Dakota, and the Canadian provinces mentioned above.

Nearly 40 varieties have been named and released after testing in this well-established program. Dr. Robert H. Johannsen, potato breeder in the Department of Horticulture, North Dakota State University, is the program coordinator. Ohio has been one of the cooperating states for many years.

Eighteen varieties and selections were evaluated in the NCR plot at the Ohio Agricultural Research and Developmental Center, Wooster, Ohio. These 18 varieties included Norland, Red Pontiac, Norchip, Russet Burbank, and Norgold Russet as standard varieties. In addition, Ohio investigators added Atlantic, Monona, and Denali. Plant breeders submitted eight white selections, four red varieties, and seven russet varieties. The new red variety - Red Cloud (NE 143.70-2) from Nebraska was not included in the Ohio trial.

Plots were single rows, 30 feet long, and were replicated three times in a randomized complete block design except for the three Minnesota selections-MN 10874, MN 11373, and MN 11795 which were in single plots. The plot was planted May 15 and the vines were killed (with Diquat) September 4 and 11.

The fertilizer program consisted of 1200 pounds of 10-20-20, one-half applied as a plow-down application and the remainder applied in bands at planting time. Dual/Lexone combination was applied immediately after planting. Fungicides and insecticides were applied during the growing season as suggested in the pesticide guides from the Ohio Cooperative Extension Service.

Plots were harvested September 20 and tubers were picked by hand and weighed for gross yield per plot. A representation sample- approximately 50 pounds - was taken from each replicate to be graded for U.S. No. 1, B.S., and culls. At grading time, tubers were also evaluated for internal and external defects. At harvest, a 20 pound sample was collected for specific gravity and other chipping characteristics. A maturity rating was made August 25.

La 01-38 had the highest gross yield, followed by Russet Burbank, Red Pontiac, MN 10874, and Norgold Russet. In the 1983 NCR trials, La 01-38 was one of the outstanding entries. However, the percentages of U.S. No. 1 for Russet Burbank (38%) and MN 10874 (39%) were very low in the 1984 trial. Previous experiences with Russet Burbank, under Ohio conditions, have grown similar results. The Wisconsin 855 had a favorable specific gravity (1.080). The Minnesota lines 11373 and 10874 had attractive tubers, but need more testing under Ohio conditions. La 82-119 is a promising red variety. It is later maturing than Red Norland, but earlier than Red Pontiac. The specific gravity of La 82-119 (1.080) was much higher than Red Norland (1.066) or Red Pontiac (1.061).

Ohio Table 1. Average U.S. No. 1 Yields, Grade, and Specific Gravity Statewide Trials - Six Farms, 1984.

Entry	Average Stand (%)	Average Yields Cwt/A	Average Specific Gravity	Average Percent		
				U.S. No. 1	B Size	Culls
Conestoga	89	230	1.072	81.9	4.5	13.6
ND 388-1	96	199	1.073	78.8	11.2	10.0
Norchip	80	208	1.073	73.7	5.5	20.8
Katahdin	92	315	1.069	88.7	3.1	8.2
BR7093	91	298	1.071	88.7	3.6	7.7
WF564-3	95	274	1.065	79.0	6.5	14.3
Ontario	93	292	1.067	77.5	7.3	15.3
Acadia Russet	80	240	1.067	83.2	2.5	14.3
*BR5991-WV16	87	303	1.072	85.7	7.2	7.1
Neb.A129.69	91	278	1.069	89.4	4.4	6.2
Average	90	259	1.069	82.3	5.3	12.4
*Alaska 114	95	256	-	78.7	9.2	2.9
*Jemseg	80	281	-	89.1	1.5	9.4

*One Farm Only

Ohio Table 2. Observation trials - two farms, 1984
yield, specific gravity and chip color.

Cultivar	Yield CWT/A	Specific Gravity	Chip Color PC/SFA	Yield CWT/A	Specific Gravity	Chip Color PC/SFA
La-01-38	348	1.075	1	523	1.072	2
WNC521-12	331	1.090	3	394	1.084	3
AK10-1	313	1.090	2	343	1.060	2
CF7688-9	257	1.080	2	394	1.085	2
CF74135	221	1.075	2	415	1.083	-
Alasclear	306	1.076	2	330	1.078	3
Kennebec	223	1.071	1	399	1.080	1
G670-11	250	1.086	2	338	1.070	2
Islander	230	1.076	1	353	1.075	4
B6949-WV3	257	1.070	2	322	--	-
Superior	209	1.069	2	366	1.069	3
Simcoe	231	1.078	1	324	--	-
A972-1	232	1.060	2	322	1.067	1
ND534-1	239	1.060	3	302	1.072	2
Atlantic	231	1.060	3	302	1.072	2
Yankee	197	1.076	3	329	1.078	3
Supreme						
G654-2	170	1.060	3	347	1.084	3
B5662- WV-13	181	1.068	2	244	--	-

Chip Color, PC/SFA Fry Color Standards for Potatoes for
Chipping Potato Chip/Snack Food Association.

Ohio Table 3. Specific gravity, chip color, and percent blisters, Celeryville Muck Trials, 1984.
(Replicated Trial).

Cultivar	Yield CWT/A	Spec. Gravity	Chip Color	Chip Color	% Blisters
			Agtron	PC/SFA	
Ontario	449	1.069	26.1	4	10
La-01-38	396	1.077	44.1	3	20
A129-69-1	369	1.063	30.9	4	40
BR5991-WW6	345	1.073	40.3	3	10
Kennebec	337	1.074	41.3	3	50
B6949-WV3	323	1.073	46.8	3	20
CF74135-3	316	1.068	42.2	1	10
Alasclear	316	1.076	40.0	3	30
G670-11	311	1.081	44.4	3	20
Belchip	309	1.076	50.3	3	20
Acadia	308	1.072	18.1	5	60
Russet					
Katahdin	301	1.069	45.9	3	0
Beige	297	1.077	37.3	3	10
Simcoe	282	1.077	42.2	3	20
Atlantic	277	1.088	55.2	2	20
Denali	256	1.085	49.8	2	10
WF564-3	234	1.061	20.8	5	20
WNC521-12	229	1.092	45.9	3	50
Bake King	221	1.086	27.0	4	40
Jemseg	217	1.073	48.8	3	50
Conestoga	182	1.068	52.6	3	20
CF7688-9	175	1.083	40.7	3	10
G-654-2	136	1.062	40.6	3	10

Ohio Table 4. Gross yield, and percent U.S. No 1, and chip data North Central Regional Trial. Ohio Agricultural Research and Development Center, Wooster, Ohio, 1984.

Entry	Total Yield (CWT/A)	% U.S. No. 1	Specific Gravity	Chip Color PC/SFA	Agtron
ND 534-4	286	64	1.072	3.0	46.9
Norgold	298	72	1.074	3.5	35.1
Russet					
Red Norland	274	82	1.066	3.0	50.1
Norchip	288	47	1.077	2.0	52.9
ND 860-2	176	73	1.075	2.0	53.3
Red Pontiac	316	70	1.061	4.0	31.6
Russet	330	38	---	---	---
Burbank					
ND 388-1	242	71	1.072	3.0	48.8
LA 82-119	283	69	1.080	3.0	54.5
LA 01-38	345	80	1.074	3.0	55.0
Wisc. 779	204	64	1.071	3.0	55.1
Wisc. 855	262	73	1.080	3.0	22.8
NE 9.72-1	267	60	1.071	3.0	44.6
NE 26.72-2	140	37	1.075	3.0	52.7
BN 9803-1	179	36	1.080	3.0	58.2
MN 10874	311	39	1.078	4.0	34.6
MN 11373	285	64	1.073	3.0	45.9
MN 11795	253	21	1.079	2.0	55.8
Atlantic	220	67	1.080	2.0	58.6
Monona	115	47	1.064	2.0	57.1
Denali	159	31	1.087	3.0	50.2

Rainfall:

May	- 5.38"
June	- 1.66"
July	- 2.94"
August	- 5.09"
September	- 2.41"

Mean Temperatures:

May	- 54.3°F.
June	- 69.4°F.
July	- 68.6°F.
August	- 69.7°F.
September	- 60.0°F.

Ohio Table 5. Gross yield, percent U.S. No. 1 specific gravity and chip color. Northeastern Regional Trial, Ohio Agricultural Research and Development Center, Wooster, Ohio, 1984.

Cultivar	Total Yield (CWT/A)	% U.S. No. 1	Specific Gravity	Chip Color PC/SFA	Agtron
AF330-1	241	67	1.079	2	53.4
B6928-WV14	211	66	--	-	--
Goldrus	225	65	--	-	--
BR7088-18	277	69	1.075	2	60.0
WF564-3	234	56	1.069	3	31.2
NY 59	234	74	1.070	4	38.4
Allagash	199	66	1.071	2	60.1
Russet					
Simcoe	279	75	1.081	3	50.5
Yankee	331	63	1.076	2	63.9
Chipper					
Islander	295	71	1.077	2	57.0
Katahdin	189	54	1.067	3	48.6
CF7688-9	232	61	1.084	3	50.1
Conestoga	250	65	1.072	3	55.0
B6949-WV3	273	82	1.070	5	17.9
Acadia	308	75	1.066	2	54.6
Russet					
CF77154-10	292	72	1.078	2	58.6
Chipbelle	214	64	1.078	2	54.4
CF76183-2	184	48	1.074	2	53.5
MN9319	122	74	1.072	3	53.8
F73008	246	51	1.060	2	54.5
Yukon Gold	270	79	1.077	2	58.3
AF236-1	269	64	1.076	2	55.0
Hampton	217	75	1.074	2	64.5
BR7093-23	275	62	1.071	3	57.9
AF303-5	183	38	1.076	3	47.2
CF74135-3	134	36	1.060	2	63.2
Belrus	184	39	1.086	2	61.1
Superior	242	52	1.075	3	52.3
Yankee	170	43	1.074	3	45.2
Superior					
Ontario	168	--	1.064	3	43.2

Ohio Table 6. Gross yield, percent U.S. No. 1, specific gravity, and chip color. Selected observational and breeding lines. Single plots, Ohio Agricultural Research and Development Center, Wooster, Ohio 1984.

Cultivar	Total Yield CWT/Acre	% U.S. No. 1	Specific Gravity	Chip Color PC/SFA	Agtron
Tolaas	250	73	1.071	3	51.6
Agassiz	300	67	1.071	2	57.9
MN 9648	318	70	1.073	3	50.9
NS700-70	417	85	1.080	3	53.5
Wisc. 903	374	88	---	-	--
Wisc. 752	231	69	---	-	--
MS002-1714	272	59	---	-	--
B9140-32	288	77	---	-	--
B9340-13	312	65	---	-	--
WF31-4	415	88	---	-	--
B9540-62	347	75	1.079	3	54.3
B9553-6	340	60	1.067	3	52.5
B9569-2	272	68	1.076	3	53.7
B9740-4	227	75	1.081	3	46.1
B9398-2	238	57	1.081	3	57.6
B9752-7	253	60	1.078	3	42.8
B9596-2	152	57	1.064	3	39.4
B9720-3	241	69	1.084	3	56.8
MS716-15	132	85	1.079	2	56.0
Minn 11373	285	64	1.073		45.9
Minn 11795	253	21	1.079	2	55.8
Minn 10874	311	39	1.078	4	34.6
MS704-10	370	61	1.083	2	60.9
MS700-83	214	72	1.076	2	56.5
MS702-80	293	79	1.075	2	59.5
MS702-91	321	74	1.075	2	62.4
ND678-8	293	62	1.064	2	59.6
ND398-1	331	85	1.085	2	48.8

Ohio Table 7. Field evaluation and specific gravity of potato varieties grown at Napoleon, Ohio; Campbell Institute of Research and Technology, Campbell Soup Company.

Variety	Total Yield	Percent Marketable (Over 1-7/8")	Marketable Yield (CWT/A)	Specific Gravity
Kennebec	656	92.8	609	1.069
BR5991-WV15	619	88.5	480	1.080
*WF564-3	567	69.2	395	1.060
Al29-69-1	539	91.3	493	1.063
Surechip	527	87.7	462	1.063
Katahdin	522	95.0	496	1.066
Ontario	509	87.0	444	1.080
Norchip	483	82.7	400	1.069
Yankee Supreme	482	91.6	443	1.080
Acadia Russet	471	92.8	438	1.065
Atlantic	469	91.4	428	1.070
Superior	438	90.0	399	1.068
Denali	418	85.4	358	1.084
B5662-WV13	398	92.8	370	1.070
ND3881	350	70.4	246	1.070
C654-2	299	74.1	221	1.060
Jemseg	261	92.5	242	1.063
Bayes LSD.05	62	2.8	54	
CV	14.1	3.6	14.2	
G670-11	555	94.3	523	1.090**

*This variety had 13% stem end rot.

**Seed for two replicates only.

A. Location - Research Farm, Napoleon, Ohio

B. Planting Date - May 18, 1984

C. Harvest Date - October 4, 1984

D. Experimental Design - Randomized Block

E. Number of Entries - 18

F. Number of Replications - 4

G. Row Spacing - 34 inches

H. Plant Spacing - 10 inches

I. Plot Size - One row, 20 feet long

J. Fertilizer - Broadcast 500 lbs. 10-10-30 plus 200 lbs. of 0-0-60 500 pounds of 16-16-16 at planting

K. Disease and Direct Control - Maneb and Sevin

L. Herbicide - Lasso/Sencor, pre-TM (Tank Mix)

Credit: Dr. R.D. Peel & R. Henne, Campbell Inst. for Res.&Tech.

OREGON

A. Mosley, D. Hane, S. James, G. Carter, C. Stanger and S. Perrigan

Introduction

Early Generation Selections: Oregon State University campus and branch experiment station personnel evaluated some 35,000 first-year selections at Powell Butte and Hermiston; about four percent of these were selected for further testing. Several hundred four- and 12-hill selections were also evaluated in 1984.

Some 60,000 seedlings will be field-transplanted at Hermiston for selection purposes in 1985. An additional 25,000 will be planted in pots outside at Redmond for production of seedling tubers on an experimental basis. Tubers will be used for field selection in 1986.

True seed for Oregon tests was provided by Dr. J. Pavsek of the USDA breeding program at Aberdeen, Idaho. Dr. Pavsek also provided several thousand first-generation tubers as did Dr. David Holm (Colorado State University)

Four replication variety yield trials in the Hermiston and Willamette Valley areas will be briefly discussed in this report. Commercially accepted cultural and pest control procedures were used in all trials regardless of location.

Hermiston

Six trials were conducted by the Hermiston Station but only three on-station tests will be discussed here. These include the early- and late-harvested Western Regional trials and the Oregon Statewide trial.

Early-Harvested Western Regional Trial: Eleven entries were compared to Norgold in the early Regional trial (Table 1 - see also comments in Table 2). Several outyielded Norgold but only two, A74133-1 and A74212-1, seemed to be promising based on appearance as well as yield. Although high-yielding, A7411-2 and AC77652-1 showed either poor tuber conformation or unattractive skins. Several entries may have been injured by metribuzin.

Late Western Regional Trial: Twelve entries were compared to Russet Burbank and Lemhi in this test (Table 2). Lemhi was included primarily for blackspot comparison; with 58 percent of the tubers affected, it was by far the most susceptible of all entries. A69870-10, A7411-2, A74132-7 and R. Burbank also showed considerable blackspot, however.

None of the entries was outstanding when compared to Russet Burbank. A74212-1 yielded well, and tubers were attractive but specific gravity was too low for good french fry production. This selection will be tested extensively in 1985 for possible release.

Oregon Table 1. Western Regional Trial (Early Harvest). Hermiston, 1984.

Entry	Yield, Cwt/A		No. 1 % of Norgold	No. 1 Size Distribution ^{1/}				Spec. ^{2/} Grav.
	No. 1	Total		4-6	6-8	8-10	>10	
A7411-2	353	413	150	85	142	77	48	1.072
A74114-4	247	298	105	60	124	51	12	1.077
A74132-7	268	330	114	105	93	51	19	1.067
A74133-1	353	435	150	101	138	72	43	1.072
A74212-1	365	412	155	72	108	86	99	1.066
AC77652-1	318	364	135	170	107	27	14	1.067
ND534-4R	234	287	99	92	92	40	10	1.072
NDD47-1	138	159	58	80	51	6	0	1.061
NDD277-2	283	305	120	92	139	45	7	1.065
TC2-1	157	228	66	95	54	5	3	1.086
78LC-1	290	364	123	121	105	40	24	1.076
Norgold	236	318	100	150	75	7	4	1.068
LSD, 5%	104	114	-	-	-	-	-	0.005
CV, %	27.4	24.8	-	-	-	-	-	0.39

^{1/} Cwt. of potatoes in ounce categories.

^{2/} Specific gravity determinations by potato hydrometer.

Oregon Table 2. Western Regional Trial (Late Harvest). Hermiston, 1984

Entry	Yield, cwt/A		No. 1 % of R. Burb.	No. 1 Size Dist. ^{1/}		Spec. ^{2/} Grav.	Black- spot, %	Tuber Appearance
	No. 1	Total		4-10	>10			
A69870-10	467	492	98	294	173	1.078	30	Rnd med rus. Poor
A7411-2	585	646	123	345	240	1.087	23	Lng, dk rus. Off-shapes. Poor.
A74114-4	309	351	65	230	80	1.076	3	Rnd-oblong rus. Patchy skins. Purplish eyes. OK.
A74132-7	497	534	105	348	149	1.077	22	Reddish tinge. Rnd. Poor.
A74133-1	505	531	106	266	240	1.081	10	Blocky, lt rus. Smooth. Fair.
A74212-1	685	733	144	294	391	1.071	2	Long! lge, lt rus. Fair.
AC77652-1	424	456	89	289	135	1.068	7	Hvy, lt rus. Polk dts. Rnd.
ND534-4R	203	270	43	175	28	1.068	6	Smooth rus. Small. Try again.
NDD47-1	296	346	62	215	82	1.067	1	Rnd-oblong white. Scab. Poor.
NDD277-2	352	377	74	262	91	1.070	2	Rnd, lt. rus. Scab! Poor.
TC2-1	354	405	74	347	7	1.096	9	Rnd, hvy rus. Good skins. Fair.
78LC1	304	355	64	275	28	1.071	3	Small. Lt. rus. Pears. Poor.
R. Burbank	475	562	100	319	155	1.082	18	Typical. Bulgy. Dp eyes.
Lemhi	570	599	120	292	278	1.092	58	Oblong, hvy. rus. Shatter. OK.
LSD, 5%	127	132	-	74	87	0.005	-	
CV, %	20.9	19.6	-	18.6	41.5	0.34	-	

^{1/} Cwt. of potatoes in ounce categories.

^{2/} Specific gravity determinations by potato hydrometer.

Oregon Statewide Tests: Thirty entries were evaluated in this trial which was also conducted at Ontario, Klamath Falls, and Powell Butte. Results for the last three sites will be reported elsewhere.

Several selections were moderately to severely injured by metribuzin (Table 3) leading to reduced yields. Of the various entries outyielding Russet Burbank, A72685-2 seemed most promising since tubers were well shaped and russeted and showed high solids. A74212-1 and A7869-5 seemed to have potential for fresh market but not for processing due to low gravities. A079492-2 seemed to be too light-skinned for Oregon uses.

Oregon Table 3. Oregon Statewide Trial. Hermiston, 1984.

	Yield,		No. 1 % of R. Burb.	No. 1 Size Dist., oz		Spec. 1/ Grav.	Black- spot, %	Skin ^{2/} Color	Rus. ^{3/}	Tuber ^{4/} Shape	Eye ^{5/} Depth
	No. 1	Total		4-10	>10						
R. Burbank	498	613	100	326	171	1.085	24	2.8	4.0	1.0	1.8
Lemhi	615	633	123	330	285	1.096	60	3.0	4.5	2.0	1.0
Norgold	216	293	43	211	5	1.069	3	3.0	3.8	4.0	1.0
Nooksack	490	506	98	180	310	1.092	4	2.5	3.5	4.8	1.0
A68678-2*	365	399	73	195	169	1.084	42	3.0	4.3	2.0	1.0
A69870-10	516	533	103	275	241	1.082	34	3.0	4.3	4.3	1.3
A71997-8	459	524	92	414	45	1.084	7	3.0	4.9	2.8	1.0
A7242-3	576	603	115	434	141	1.082	18	2.0	2.3	5.0	1.0
A7279-12*	519	589	104	339	180	1.088	15	2.0	2.8	5.0	2.0
A72685-2	649	692	130	312	336	1.090	19	3.0	4.0	4.0	1.5
A74212-1	673	722	135	396	276	1.077	14	2.3	3.0	1.3	1.3
A7532-1	523	601	104	402	120	1.086	20	3.0	4.5	1.3	1.0
A77153-3	580	608	116	262	318	1.090	17	2.0	3.0	1.5	1.0
A7811-16	414	451	83	269	145	1.078	39	3.0	4.8	3.5	1.3
A7814-6	309	379	62	281	28	1.075	5	3.0	4.0	1.0	2.8
A7836-28	413	482	83	311	102	1.090	28	2.5	3.5	2.8	1.0
A7869-5	745	780	149	266	478	1.079	29	2.8	3.5	2.5	1.3
A079492-2	658	702	132	529	129	1.082	11	1.3	1.3	4.8	1.8
C007908-1	517	553	103	395	121	1.084	6	2.0	2.8	1.5	1.5
C007921-1	429	476	86	284	144	1.071	20	3.0	4.3	3.5	1.0
ND388-1	400	433	80	331	69	1.079	16	3.0	4.3	3.0	1.3
ND681-3	416	472	83	277	138	1.082	21	1.8	2.0	3.0	1.0
ND678-8*	173	249	34	164	9	1.059	4	1.3	1.5	3.8	1.0
NDA815-1*	216	282	43	205	11	1.069	3	3.0	3.8	2.8	1.0
NDA1238-2	286	353	57	257	28	1.073	3	3.0	4.5	2.0	1.0
NDA124-1*	83	114	16	73	9	1.068	2	3.0	3.8	3.5	1.0
NDA1242-3*	238	291	47	234	4	1.076	5	3.0	4.0	3.8	1.0
NDA1246-4*	373	430	74	289	83	1.063	4	2.3	3.0	2.8	1.0
NDA1276-3*	58	75	11	41	16	1.063	1	3.0	5.0	2.0	1.0
NDA1309-6	498	528	100	302	196	1.098	44	3.0	4.5	2.0	1.0
LSD, 5%	108	109	-	79	75	0.005	-	-	-	-	-
CV, %	17.8	16.1	-	19.6	37.2	0.34	-	-	-	-	-

1/ Specific gravity determinations by potato hydrometer.

2/ Skin color: 1 = white; 2 = tan; 3 = brown; 4 = red.

3/ Russetting: 1 = none; 6 = very heavy.

4/ Shape: 1=long; 2=blocky; 3=pear; 4=round; 5=flat.

5/ Eyes: 1=shallow; 2=medium; 3=deep.

Willamette Valley

Potato varieties were evaluated for chip and tablestock uses at Corvallis.

Corvallis: Promising varieties at Corvallis included ND388-1, Rosa, ND534-4, and Crystal (Table 4). ND388-1 produced oblong, medium-russeted, generally well-shaped and shallow-eyed tubers. Yield and grade-out were better than for Russet Burbank but gravity was lower. Although 1984 was a relatively poor year for ND534-4, it also outyielded Burbank and produced smoother, more attractive tubers. ND534-4 seemed to have excellent fresh market potential for the Willamette Valley.

Oregon Table 4. Performance of 12 Potato Varieties at Corvallis, Oregon. 1984.

Variety	Yield, cwt/A		% Mkt	oz/ Tuber	Specif. ^{1/} Gravity	Comments ^{2/}
	Total	Mkt				
Norchip	384	316	82	6.5	1.091	R. W. Rgh.
Norchip (new)	374	286	76	6.2	1.092	More skin netting, later than Norchip
ND678-8	406	356	88	7.2	1.086	R. W. Gr. lenticels.
ND388-1	393	318	81	8.6	1.089	O-L med. rus. OK.
R. Burbank	397	188	46	7.0	1.095	L rus. Rough!
Rosa	476	426	89	5.9	1.094	R. W. Pink eyes. Later than Norchip.
ND534-4	372	305	82	7.8	1.088	O-L med. rus. Good!
ND967-1	399	253	74	6.3	1.078	Rus. AH. TC. Flat. Fair.
Reddale	421	354	85	9.3	1.076	Red. Pale. Eyes. Lge.
Tolaas	348	298	85	8.8	1.082	R-O. Med. rus. Late. Fair.
Crystal	500	432	86	7.6	1.086	R. W. Rgh. Late.
Denali	384	314	81	6.6	1.103	R. W. Late. Fair.
LSD, .05	100	88	7	-	.008	

^{1/} Specific gravity determination by potato hydrometer.

^{2/} R = round; W = white; Rgh = rough; Gr = green; O = oblong; L = long; AH = alligator hide; TC = thumbnail crack.

Rosa and Crystal were included as potential chipping varieties. Both yielded well but Crystal tubers showed low specific gravity compared to the standard Norchip. Crystal also seemed to be prone to lenticel infection and tuber decay. Rosa consistently outyields Norchip and seems to chip about as well. Rosa tubers are attractive with distinctive pinkish eyes; shape and eye-depth are similar to Norchip.

Tolaas, Reddale, ND967-1 and ND678-8 appeared to have little promise in the Valley. However, the russet-skinned Tolaas and ND678-8 will probably be tested further. Denali has performed erratically but generally chips well and has high solids.

TEXAS

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development and Testing

Seedling Program. Approximately 36,000 first-year seedlings, representing 316 families, were grown for selection near Hereford in 1984, and 141 original selections were made from this material. The 1984 first-year seedlings from Texas resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock during the winter of 1982-83. The remainder were obtained from Joe Pavcek in Idaho (10,309), Bob Johansen in North Dakota (12,900) and Florian Lauer in Minnesota (3000). The Texas program also supplied the North Dakota, Idaho and Colorado programs with second, third and fourth sized seedling tubers for selection.

Adaptation Trials. The variety and advanced selection trial at Olton (Table 1) was planted on April 5 and harvested on August 13. In general, yields were exceptionally high. New Norchip is the only white entry deserving mention based on total yield. The outstanding red entry was Red LaSoda. Several Russets were outstanding in performance. Those deserving mention include: A 69.72-2, TX 9-649-9 Ru, ATX 9-7738-8 Ru, ND 388-1 Ru, TX 9-652-10 Ru, ATX 6-74198-1 Ru, ATX 9-77255-7 Ru, TX 9-646-6 Ru, ND 7003-2 Ru, Mn 10874 and Lemhi.

The strip trial at Olton (Table 2) consisted on 12 of our most promising selections for which sufficient seed supplies were available for large scale planting of 800 feet of row. The outstanding entry in this trial was Krantz (Mn 9648; MnTX 5-8-1 Ru) which significantly outyielded even the check variety, Norgold "M". The two top yielding entries, TX 9-649-9 Ru and TX 9-646-6 Ru, exhibit tuber shapes which adversely affect their overall performance.

Advanced selections from various breeding programs were tested under Texas conditions (Table 3). Several of these entries performed well relative to the check varieties. Those deserving mention include TX 0-754-1 Ru, NDTX 8-731-1 R, Mn 10874, NDTX 8-666-1 Ru, A 7914-33, NDTX 9-1068-11 R and Krantz (Mn9648) (MnTX 5-8-1 Ru).

A number of Norgold Russet strains, as well as Norgold Russet were tested at Olton and Hereford (Tables 4 and 5). At Olton (Table 4), there was no significant difference in yield among strains with the exception of Norgold #10 which yielded poorly this year. All strains, except for Norgold #10 produced significantly higher total yields than Norgold Russet. The outstanding entries, based on appearance and total yield, were Norgold #19-3, Norgold #19-2 and Norgold #19-1. As in past years, the strains continue to outperform Norgold Russet on sandy soil. At Hereford (Table 5) the outstanding entry based on field evaluation was Norgold "M" (Neb) obtained from Nebraska Potato Shippers, Inc. Norgold

#10-7, Norgold "M" (Shaver), Norgold #19-2 and Norgold #11 all performed quite well; however, Norgold #10-7 and Norgold #11 produced smaller tubers.

Summarizing results from all trials at both Olton and Hereford, the most promising entries were NDTX 9-1068-11 R and Krantz (Mn9648). Other selections which performed well at both locations were TX O-754-1 Ru and TX 9-646-6 Ru. These and other selections are being increased in our newly initiated rapid multiplication program.

Texas Table 1. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor, maturity, and general rating of 44 potato varieties or selections grown at Olton, Texas - 1984.

Variety or Selection	Total Yield CWT/A.	Percent by Wt. Over 4 oz.	Average Tuber Wt. of 8 oz.+ Grade	Average Weight/ Tuber in oz.	Vigor- 1/	Maturity- 2/	General Rating- 3/
Red LaSoda	651.0	93.3	14.1	9.4	4.0	2.8	4.0
TX 7-294-1-Ru	497.7	89.3	11.3	6.6	3.5	3.3	3.8
Reddale	494.2	92.6	12.4	8.1	3.2	2.8	3.9
A 71.72-1	471.6	85.0	11.2	7.6	3.7	2.9	3.1
New Norchip	468.1	70.6	10.7	4.8	4.0	2.6	3.1
Lemhi	458.5	89.0	14.1	8.8	4.2	1.9	3.9
A69.72-2	455.0	92.2	13.5	6.8	3.8	2.9	4.2
TX 9-649-9 Ru	448.9	95.5	14.5	11.0	3.5	3.3	3.8
ATX 9-7738-8 Ru	442.8	85.1	13.7	7.2	3.9	3.0	3.8
ND 388-1 Ru	436.4	88.0	10.6	7.0	3.8	3.7	3.9
TX 9-652-10 Ru	430.9	92.5	12.4	8.2	3.6	3.7	3.8
ATX 6-74198-1 Ru	429.7	85.8	10.9	7.0	3.2	3.6	3.8
ATX 9-77255-7 Ru	429.7	89.7	11.9	7.3	3.8	3.8	3.8
TX 9-684-1 Ru	427.7	90.0	12.2	7.9	4.2	2.8	3.5
TX 9-646-6 Ru	427.4	94.3	14.9	11.1	3.8	2.2	4.0
ND 7003-2 Ru	424.5	87.3	12.6	7.8	3.6	3.3	3.9
TX 9-581-2 Ru	421.9	89.0	15.3	9.1	2.9	2.7	3.5
Alasclear	418.4	86.5	12.6	7.2	3.7	3.1	3.1
Dark Red Norland #13	417.8	89.7	11.3	6.9	3.9	3.1	3.7
TXND 22-2	417.5	85.6	9.7	5.6	3.7	3.0	3.6
Sangre	417.3	90.8	11.4	8.1	2.9	2.5	3.6
Red Sport Viking	414.1	79.5	12.3	6.9	3.5	3.2	3.8
MnTX 9-86-1 Ru	410.6	91.4	12.2	8.1	3.9	3.0	3.9
A 9.72-1	409.7	86.0	12.6	7.9	3.8	3.6	3.9
TXA 218-7	404.8	95.1	15.8	12.2	3.2	3.7	3.3

Tolaas	402.4	83.3	11.6	7.0	3.3	3.3	3.5
ND 1113-10 Ru	379.8	80.6	10.2	6.3	3.8	3.8	3.8
Norgold "M"	377.5	88.4	13.7	8.7	3.5	2.9	3.8
Mn 10874	371.7	83.4	9.8	6.5	3.1	2.9	3.9
BN 9803-1	368.2	79.5	11.2	5.8	3.3	3.3	2.9
Super Red	363.2	91.3	10.1	6.7	3.5	4.2	3.3
A26.72-2	358.9	68.9	10.1	4.9	3.8	1.9	3.3
Norgold Russet	356.9	89.4	10.7	7.1	3.2	3.7	3.8
MnTX 8-57-1 Ru	352.2	80.0	12.5	5.6	3.7	3.5	3.5
ATX 9-77259B-8 Ru	351.9	84.1	10.8	6.6	3.9	4.2	3.7
76T001-8	345.5	83.1	10.6	5.5	3.2	3.8	3.0
ATX 9-77254-5 Ru	342.0	57.6	9.8	4.3	4.5	1.9	3.3
B 8943-4 Ru	319.4	57.7	10.3	4.6	2.6	2.8	3.3
ND 860-2	310.7	72.6	8.5	4.4	3.2	4.3	2.9
NDTX 9-858-2 W	294.7	78.8	10.9	5.0	3.3	4.3	3.3
Erik	290.9	83.5	10.6	6.5	3.1	4.0	2.9
NDTX 5-15-1 Ru	290.4	42.6	11.4	4.0	3.0	4.2	3.5
ND 321-1 Ru	277.9	78.6	14.4	7.0	3.5	2.8	4.0
Redsen	195.7	70.7	9.8	4.3	2.6	4.5	2.9

Average	395.5	83.4	11.9	7.1	3.5	3.3	3.6
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LSD (.05)	66.0	4.6	2.2	1.4			
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1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

Texas Table 2. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, specific gravity, tuber type and skin type of 12 advanced selections and 1 check variety of potatoes grown in a strip trial at Olton, Texas - 1984.

Selection or Check Variety	Total Yield CWT/A.	Percent by Wt. Over 4 oz.	Average Tuber Wt. of 8 oz.+ Grade	Average Weight/ Tuber in oz.	Specific Gravity	Tuber Type	Skin Type
TX 9-649-9 Ru	484.4	87.2	12.5	8.8	1.062	Oblong	Russet
TX 9-646-4 Ru	470.3	87.9	12.1	8.3	1.073	Oblong	Russet
Krantz	440.5	90.3	11.9	8.8	1.075	Oblong	Russet
ATX 9-7738-8 Ru	425.4	75.7	12.2	6.9	1.076	Long	Russet
ATX 9-7738-9 Ru	418.4	80.6	12.0	7.0	1.071	Long	Russet
TX 9-646-6 Ru	411.0	96.4	15.4	10.8	1.062	Round	Russet
TXA 218-7	371.1	83.3	13.0	7.4	1.068	Long	Red
Norgold "M"	365.4	84.0	12.1	7.8	1.074	Long	Russet
ATX 9-77266-2 Ru	351.0	77.1	9.7	5.4	1.065	Oblong	Russet
ATX 9-77259B-7 Ru	330.9	46.0	8.7	4.4	1.073	Long	Russet
MnTX 8-57-1 Ru	294.4	80.5	9.9	5.7	1.074	Oblong	Russet
76T001-8	277.0	74.9	9.4	5.8	1.062	Oblong	White
ATX 8-71881-2 Ru	254.6	89.5	10.7	6.2	1.057	Long	Russet
Average	376.5	81.0	11.5	7.2	1.069		
LSD (.05)	67.9	7.3	2.1	1.1			

Texas Table 3. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor, maturity, and general rating of 19 Idaho, Minnesota, Minnesota-Texas, North Dakota-Texas, and Texas advanced selections and 7 check varieties of potatoes grown at Olton, Texas - 1984.

Selection or Check Variety	Total Yield CWT/A.	Percent by Wt. Over 4 oz.	Average Tuber Wt. of 8 oz.+ Grade	Average Weight/ Tuber in oz.	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} Rating
Red LaSoda	796.2	94.3	14.0	9.6	4.6	2.8	3.9
TX 7-754-1-Ru	771.8	92.3	13.6	7.9	3.4	3.3	3.8
Mn 82423	761.4	59.0	8.9	3.7	4.0	1.0	2.5
NDTX 8-731-1 R	696.0	79.9	10.2	5.1	3.5	2.8	3.7
Mn 12161	634.2	79.3	7.7	5.7	3.9	3.8	2.8
Mn 10162	623.7	67.6	16.0	6.3	3.9	2.5	2.8
Mn 10874	614.1	89.0	14.4	7.2	3.8	3.0	3.7
Reddale	610.4	86.3	11.0	6.7	3.9	2.5	3.3
Norgold "M"	608.0	85.5	16.4	8.6	3.3	3.3	3.7
Erik	572.3	86.8	12.6	6.9	3.5	3.5	3.3
Krantz	543.6	90.0	13.0	8.0	4.0	3.3	3.7
NDTX 8-666-1 Ru	538.4	81.8	11.9	6.1	2.9	3.3	3.8
TX 0-757-1 Ru	527.0	94.9	11.6	7.9	3.3	4.5	3.3
Mn 8742	526.2	64.2	12.4	6.8	3.8	3.2	3.0
Mn 11903	524.4	88.7	11.6	5.8	3.3	2.8	2.8
Tolaas	510.5	85.6	11.9	6.8	3.3	2.9	3.0
Mn 11753	458.2	74.4	12.3	6.9	3.5	2.8	3.0
TX 9-655-20 Ru	454.7	87.3	12.4	6.5	3.5	3.0	3.5
Mn 11373	453.0	77.9	9.7	5.5	3.7	2.9	3.0
Agassiz	406.8	57.3	9.4	4.3	3.4	3.3	2.9

Selection or Check Variety	Total Yield CWT/A.	Percent by Wt. Over 4 oz.	Average Tuber Wt. of 8 oz.+ Grade	Average Weight/ Tuber in oz.	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} Rating
Norgold Russet	393.7	84.9	12.6	6.9	3.8	2.8	3.8
Mn 11705	376.3	63.4	12.4	6.2	2.9	3.5	2.8
A 7914-33	331.0	89.4	12.2	7.2	3.5	1.0	3.8
NDTX 9-1068-11 R	320.6	77.7	11.6	5.5	2.0	2.0	3.7
Mn 11795	250.9	49.6	10.4	3.3	3.2	3.3	2.5
Mn 11605	152.4	67.8	8.8	3.1	3.4	2.4	3.0
Average	517.6	79.1	11.9	6.4	3.5	2.9	3.3
LSD (.05)	166.7	9.7	2.6	1.0			

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

Texas Table 4. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor and maturity of 12 Norgold Russet strains, as well as Norgold Russet grown at Olton, Texas - 1984.

Selection or Check Variety	Total Yield CWT/A.	Percent by Wt. Over 4 oz.	Average Tuber Wt. of 8 oz.+ Grade	Average Weight/ Tuber in oz.	Vigor ^{1/}	Maturity ^{2/}
Norgold #19-3	396.1	90.5	12.3	7.7	3.8	2.0
Norgold #35	387.9	92.2	15.2	9.0	3.5	3.3
Norgold "M" (Shaver)	387.6	95.2	15.8	9.9	3.5	3.3
Norgold "M" (Neb)	379.2	88.4	14.8	9.6	3.5	3.5
Norgold #10-7	378.1	93.2	12.2	8.2	3.5	3.3
Norgold #19-1	377.2	94.5	16.5	9.6	3.6	2.7
Norgold #40	373.7	89.6	12.4	7.8	3.8	3.0
Norgold #11	373.4	86.5	12.5	6.9	3.7	3.2
Norgold #19-0 (S. Barrett)	364.1	83.7	14.7	7.6	3.5	2.0
Norgold #19-2	350.5	96.2	15.6	10.4	3.6	2.9
Norgold #12	337.4	89.5	12.9	7.5	3.3	3.2
Norgold Russet	222.1	91.0	12.7	6.9	2.9	3.5
Norgold #10 (S. Barrett)	170.7	84.6	8.0	5.6	3.0	3.0
Average	346.0	90.4	13.6	8.2	3.5	3.0
LSD (.05)	73.2	3.6	3.2	1.8		

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

Texas Table 5. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor and maturity of 10 Norgold Russet strains, as well as Norgold Russet grown at Hereford, Texas - 1984.

Selection or Check Variety	Total Yield CWT/A.	Percent by Wt. Over 4 oz.	Average Tuber Wt. of 8 oz.+ Grade	Average Weight/ Tuber in oz.	Vigor ^{1/}	Maturity ^{2/}
Norgold #10-7	324.6	66.8	7.4	4.0	3.5	2.9
Norgold "M" (Shaver)	314.2	76.9	12.6	5.5	3.8	3.2
Norgold #19-2	313.3	73.4	11.0	4.7	3.6	2.9
Norgold #11	311.5	57.0	9.8	3.7	3.7	2.8
Norgold "M" (Neb)	285.4	80.1	13.6	5.3	3.7	3.2
Norgold #35	275.5	73.3	10.4	4.8	3.7	3.5
Norgold #12	250.6	58.8	9.2	4.3	3.8	2.9
Norgold Russet	221.5	72.2	8.8	4.1	3.0	3.2
Norgold #40	218.0	59.4	10.9	3.8	4.2	1.2
Norgold #19-1	215.7	62.8	9.9	4.5	4.0	2.3
Norgold #19-3	202.6	35.9	9.0	3.8	3.9	2.0
Average	266.7	65.2	10.3	4.5	3.7	2.7
LSD (.05)	39.4	7.3	2.1	1.0		

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

VIRGINIA

S. B. Sterrett and C. P. Savage, Jr.

Purpose

Round white and russet selections are evaluated for regional adaptability. Improved yield, early sizing, internal and external tuber quality, and chip potential (round whites) are also important.

A total of 48 round white and 23 russet varieties and clones were evaluated in the replicated trials. Observational trials included 21 round white and 8 russet selections.

Plot Procedures

A randomized complete block design with four replications of single 25 foot row plots was used for all but the observational trial. The observational trial consisted of 20 foot rows unreplicated. All plots received band-placement of 1000 pounds 10-10-10/A as well as 3 pounds ai/A aldicarb. Standard cultural practices were maintained, using linuron (.38 pound ai/A) + metolachlor (1.25 pound ai/A) as herbicides and oxyaryl (0.25 pound/A) + carbofuran (0.5 pound ai/A) for insect control. With the exception of the 'Breeder's Choice' trial which was harvested July 12, all trials were harvested on July 7.

Results

Interregional Round White: Greater marketable yields were produced with B9192-1 than with Superior. Heat sprouting was a problem with Pungo and B9192-1. Heat necrosis was observed in Atlantic, B9384-4, WF31-4, WF46-3, and WF46-4.

Advanced Round White: Numerous selections exceeded Superior in marketable yield. Those combining improved yield with desirable tuber shape, size, set, and appearance include B9581-10, B9792-84, and U715-64. Problems with heat sprouts (ratings ≥ 6 on a 1-9 scale, 9=extreme) were evident with Pungo, B9311-7, B9786-14, and B9792-84. Severe second growth was recorded for Norchip, Pungo, Superior, B9533-12, B9536-11, B9536-23, B9786-14, B9792-84, and U729-21.

Selections with good chip color at 22 days after harvest include B9423-4, B9510-5, B9528-10, B9541-14, B9792-13B, and B9792-80. Chip colors of Superior and Atlantic were unacceptable after 12 days.

Interregional and Advanced Russets: Greatest marketable yield was recorded for Norgold Russet, B9540-62, and B9596-2. However, inconsistent shape and severe second growth in B9596-2 will limit interest in this selection. Other selections with excessive second growth include B9540-55, B9959-20, Norgold Russet, and Russet Burbank.

'Breeder's Choice' Russets and Round Whites: Selections of merit in terms of yield include B9192-1 and B9224-1 (round whites) and B9596-2 (russet).

Observational Trial: The highest yielding round white selections included B9792-8B, B9792-144, B9792-194, and B9792-197. Of these, B9792-8B, B9792-144, and B9792-194 had greater than 20 percent (by weight) large tubers ($>3\frac{1}{2}$ "). Chip color readings lighter than or equal to Atlantic were recorded for B9792-8B, B9792-19B, B9792-132, B9792-193, and B9792-196. Heat sprouts were a problem in B9956-7, while excessive second growth was found in B9792-78, B9792-190, and B9792-197.

Virginia Table 1. Total Yield, Size Distribution, and Internal Defects of Interregional Round White Selections -1984,

Clones	Stand _{1/} Count	Total Yield >1-1/2" cwt/A	Marketable Yield >1-7/8" cwt/A	% Superior Yield >1-7/8"	% Of Total Yield			Internal Defects ^{2/}	
					1-7/8 - 2-1/4"	2-1/4 - 3-1/2"	>3-1/2"	Hollow Heart Necrosis	
								Heart	Necrosis
Atlantic	22.5	167.0	127.5	81.5	19.0	42.0	15.0	0	6
Pungo	21.0	146.9	109.2	69.8	17.5	46.8	10.3	0	1
Superior	24.0	182.1	156.4	100.0	15.5	54.5	15.7	0	0
B 9140-32	15.5	106.0	81.8	52.3	20.3	49.8	7.1	0	0
B 9192-1	22.8	194.1	165.2	105.6	16.7	49.3	19.0	0	0
B 9340-13	17.3	93.4	69.0	44.1	18.4	51.4	2.9	0	0
B 9384-4	23.3	144.5	89.9	57.5	25.2	33.4	3.2	0	4
WF 31-4	22.0	177.7	137.5	87.9	19.0	42.0	16.6	0	7
WF 46-3	23.3	177.5	131.4	84.0	18.6	40.0	15.4	0	9
WF 46-4	19.5	155.5	121.8	77.9	16.0	50.7	12.4	0	9
Duncan-Waller (0.05)		41.9	32.7						

^{1/} Stand count taken 6 weeks after planting; perfect stand = 25 plants.

^{2/} Evaluation of 30 randomly selected large tubers.

Virginia Table 2. Total Yield, Size Distribution, and Internal Defects of Advanced Round White Selections - 1984.

Clones	Stand- Count ^{1/}	Total Yield		Marketable Yield >1-7/8" cwt/A	% Superior Yield >1-7/8"	% Of Total Yield			Internal Defects ^{2/}	
		>1-1/2" cwt/A	>1-1/2" cwt/A			1-7/8 - 2-1/4"	2-1/4 - 3-1/2"	>3-1/2"	Hollow Heart	Heat Necrosis
Atlantic	22.5	234.9	200.2	154.2	17.2	50.7	17.4	6	0	0
LaChippier	21.3	213.7	180.2	138.8	12.4	47.1	24.4	0	0	0
Norchip	22.8	202.1	114.4	88.1	35.2	20.8	0.4	0	0	0
Pungo	24.0	194.6	147.7	113.8	17.4	51.8	6.3	0	0	0
Superior	21.3	147.5	129.8	100.0	18.4	51.1	18.1	0	0	0
B 9311-7	20.8	177.3	136.6	105.2	28.0	45.4	3.7	0	0	0
B 9335-35	19.8	137.8	94.8	73.0	29.8	38.4	0.6	0	0	0
B 9423-4	23.3	216.9	179.2	138.1	19.7	54.1	8.4	0	0	0
B 9510-5	25.3	231.3	186.2	143.5	19.0	50.2	11.1	0	0	0
B 9514-17	19.0	173.8	136.6	105.2	24.8	49.5	3.9	0	0	0
B 9528-10	23.8	216.8	177.3	136.6	20.7	48.5	12.4	0	0	0
B 9533-12	23.5	216.2	182.4	140.5	21.1	48.1	14.8	0	0	0
B 9536-11	24.5	219.7	114.6	88.3	28.2	23.0	0.7	0	0	0
B 9536-23	23.5	192.1	172.6	133.0	13.2	52.6	24.1	0	0	0
B 9539-9	24.0	176.6	88.9	68.5	36.1	14.4	0.0	0	0	0
B 9541-14	24.0	220.7	157.4	121.3	29.1	37.2	4.9	0	0	0
B 9541-44	23.8	172.6	137.8	106.2	24.1	52.7	3.1	0	0	0
B 9556-9	23.3	209.1	144.6	111.4	31.8	36.7	0.3	0	0	0
B 9581-2	22.3	195.7	162.9	125.5	19.9	55.0	8.2	0	0	0
B 9581-10	23.5	259.3	227.2	175.0	14.7	54.6	18.2	0	1	0
B 9602-12	23.0	180.2	144.6	111.4	23.2	53.2	3.6	0	0	0
B 9642-5	21.3	145.5	119.2	91.8	21.2	54.9	6.5	0	0	0
B 9786-14	24.0	190.5	157.7	121.5	21.1	53.4	8.2	0	0	0
B 9786-20	23.8	198.8	148.1	114.1	28.7	43.1	2.6	0	0	0
B 9792-13B	24.3	171.1	146.8	113.1	22.3	50.7	12.5	0	0	0
B 9792-69	24.8	232.2	174.5	134.4	23.3	45.1	6.4	0	0	0
B 9792-70	24.5	208.9	177.6	136.8	14.7	60.0	10.7	0	0	0
B 9792-84	23.3	234.8	188.0	144.8	21.1	52.0	6.8	0	0	0
B 9792-119	24.2	182.8	148.3	114.3	20.0	53.1	8.0	0	0	0
B 9792-136	23.3	205.8	172.2	132.7	14.4	52.4	16.6	0	0	0
B 9792-159	23.5	225.1	163.4	125.9	31.9	37.8	3.0	0	0	0
B 9792-186	24.5	186.4	98.2	75.7	31.9	20.4	0.9	0	0	0
CF 76183-2	24.5	200.3	162.0	124.8	34.4	41.4	5.3	0	0	0
NY 71	24.8	204.7	173.5	133.7	18.4	54.6	11.5	0	0	0
U 715-64	24.3	248.6	199.5	153.7	21.3	49.3	9.7	0	0	0
U 729-21	22.3	198.9	141.0	108.6	21.1	44.8	4.7	0	0	0
Duncan-Waller (0.05)		38.4	28.2							

1/, 2/ See appropriate footnotes Table 1.

Virginia Table 3. Total Yield, Size Distribution, and Internal Defects of Interregional and Advanced Russet Selections - 1984.

Clones	Stand Count ^{1/}	Total Yield		Marketable Yield >1-7/8" cwt/A	% BelRus Yield >1-7/8"	_____ % of Total Yield _____				Internal Defects ^{2/}	
		>1-1/2" cwt/A	>1-1/2" cwt/A			1-7/8 - 2-1/4"	2-1/4 - 3-1/2"	>3-1/2"	Hollow Heart		
									Heart	Necrosis	
Interregional Russets											
BelRus	22.8	101.8	47.2	100.0	24.9	19.8	1.3	0	0	0	0
GoldRus	23.3	138.7	92.1	195.1	28.7	33.8	3.6	0	0	1	1
Norgold Russet	23.8	168.4	99.8	211.4	23.7	34.5	1.2	0	0	0	0
B 9398-2	16.8	82.9	41.2	87.3	20.8	22.0	5.3	0	0	0	0
B 9400-5	20.5	117.3	54.5	115.5	22.6	23.2	0.5	0	0	2	2
B 9540-62	23.0	128.1	92.2	195.3	20.2	48.3	3.1	0	0	0	0
B 9553-6	19.3	114.3	59.2	125.4	17.6	30.6	2.7	0	0	0	0
B 9569-2	15.0	113.7	66.8	141.5	22.9	29.1	6.2	0	0	4	4
B 9596-2	23.5	164.2	99.5	210.8	30.2	26.3	3.3	0	0	0	0
B 9648-9	19.8	130.2	63.7	135.0	24.8	22.7	1.4	0	0	8	8
Duncan-Waller (0.05)											
Advanced Russets											
BelRus	21.3	142.6	86.7	100.0	33.9	26.8	0.0	0	0	0	0
GoldRus	22.5	136.6	88.7	102.3	30.9	34.1	0.0	0	0	0	0
Norgold Russet	23.5	155.1	84.8	97.8	25.5	28.8	0.0	0	0	0	0
Russet Burbank	25.3	137.2	51.8	59.7	25.4	10.9	0.4	0	0	0	0
B 9164-1	18.3	103.1	64.6	74.5	24.8	30.3	4.7	0	0	0	0
B 9540-55	22.8	105.2	54.7	63.1	30.2	21.5	0.0	0	0	0	0
B 9703-4	19.5	95.4	49.8	57.4	28.9	22.3	0.0	0	0	0	0
B 9736-3	18.8	87.0	30.9	35.6	28.3	6.2	0.0	0	0	0	0
Duncan-Waller (0.05)											
		41.7	28.9								

1/, 2/ See appropriate footnotes Table 1.

Virginia Table 4. Total Yield, Size Distribution, and Internal Defects of 'Breeder's Choice', Russet, and Round White Selections - 1984.

Clones	Stand ₁ / Count	Total Yield		Marketable Yield >1-7/8" cwt/A	% Standard ^{3/} Yield		% Of Total Yield				Internal Defects ^{2/}		Specific Gravity
		>1-1/2" cwt/A	>1-7/8" cwt/A		>1-7/8"	1-7/8 - 2-1/4"	2-1/4 - 3-1/2"	>3-1/2"	Hollow Heart	Heat Necrosis			
Russets													
BelRus	22.3	111.5	57.9	100.0	30.0	16.2	5.4	0	0	0	0	1.0754	
GoldRus	19.3	109.6	69.1	119.3	27.1	34.2	1.3	0	0	0	0	1.0686	
Norgold Russet	23.0	158.6	92.5	159.8	34.4	21.3	0.9	0	0	0	0	1.0614	
Russette	12.3	59.0	20.2	34.9	11.6	19.6	1.4	0	0	0	0	1.0579	
B 9398-2	18.0	108.0	63.3	109.3	21.6	30.6	3.3	0	0	0	0	1.0710	
B 9400-5	19.8	92.1	43.1	74.4	23.2	20.2	1.6	0	0	1	0	1.0533	
B 9523-10	19.0	129.7	85.4	147.5	26.5	36.6	0.5	0	0	0	0	1.0580	
B 9540-62	23.0	133.6	88.9	153.5	26.4	32.2	7.9	0	0	0	0	1.0666	
B 9553-6	20.3	142.2	84.8	146.5	25.2	31.8	2.8	0	0	0	0	1.0557	
B 9569-2	13.5	89.0	43.7	75.5	29.4	16.4	3.6	0	2	0	2	1.0678	
B 9596-2	22.8	151.2	93.5	161.5	36.8	24.0	1.0	0	0	0	0	1.0470	
B 9720-3	17.3	92.9	31.7	54.7	21.3	9.0	0.0	0	0	0	0	1.0667	
B 9740-4	12.3	52.0	23.2	40.1	20.2	17.4	0.0	0	0	2	0	1.0686	
B 9752-7	19.5	122.8	73.6	127.1	29.9	27.0	2.7	0	0	0	0	1.0643	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior	21.5	145.1	121.1	100.0	18.5	42.4	21.6	0	0	0	0	1.0642	
B 9140-32	19.0	127.1	93.0	76.8	26.4	36.8	9.1	0	0	0	0	1.0753	
B 9192-1	21.3	159.1	135.0	111.5	15.1	47.8	21.8	0	0	0	0	1.0611	
B 9224-6	22.3	157.8	109.3	90.3	23.4	36.4	7.4	0	0	0	0	1.0664	
B 9340-13	20.5	109.8	94.2	77.8	22.4	45.2	4.9	0	0	0	0	1.0732	
B 9384-4	22.8	151.2	79.6	65.7	26.3	35.4	0.6	0	0	0	0	1.0666	
Duncan-Waller (0.05)													
Atlantic	23.5	195.3	156.8	129.5	16.7	46.8	16.5	0	4	0	0	1.0770	
Pungo	23.8	152.6	109.6	90.5	19.5	46.8	4.6	0	0	0	0	1.0610	
Superior													

1/, 2/ See appropriate footnotes Table 1

3/ Standard for russets is BelRus; standard for round whites is Superior.

Virginia Table 5. Tuber Ratings, Specific Gravity, and Chip Color of Interregional Round White Selections - 1984.

Clones	Tuber Ratings ^{1/}					Specific Gravity	Chip Color ^{2/}			
	Shape	Size	Set	Appearance	Skin Set		Days After Harvest			
							3	12	18	22
Atlantic	2	7	7	6	4	1.0726	3	6	5	3
Pungo	4	7	4	7	2	1.0646	3	6	6	7
Superior	3	7	6	6	3	1.0668	3	6	4	6
B9140-32	2	7	5	7	2	1.0781	1	2-	4	3
B9192-1	2	7	7	7	3	1.0624	2	5	4	5
B 9340-13	3	4	5	5	3	1.0753	2+	5	3	6
B9384-4	3	3	5	5	4	1.0676	2+	2	3	4
WF 31-4	2	6	7	6	5	1.0756	3+	6	4	6
WF 46-3	2	6	7	7	4	1.0765	2	5	5	5
WF 46-4	2	7	6	7	5	1.0782	2	5	5	5

^{1/} Tuber uniformity, set, appearance: 1=very poor, 9=excellent.

Shape: 1=round, 5=oblong, 9=very long (cylindrical)

Size: 1=very small, 9=very large.

Skin set: 1=no broken skin, 9=totally peeled.

^{2/} Lower numbers denote lighter chip color. Color ratings of 4 or less = acceptable, 5=marginal, 6 or above is unacceptable. Ratings are from unreplicated samples.

Virginia Table 6. Tuber Ratings, Specific Gravity, and Chip Color of Advanced Round White Selections - 1984.

Clones	Tuber Ratings ^{1/}				Skin Set	Specific Gravity	Chip Color ^{2/}			
	Uniformity	Shape	Size	Appearance			Days After Harvest	3	12	18
Atlantic	5	2	6	5	3	1.0770	3	6	5	3
LaChippier	4	3	5	4	5	-	5	4	4	5-
Norchip	5	3	4	5	3	1.0735	2	4	3	4
Pungo	4	3	6	5	3	1.0621	3	6	6	7
Superior	5	3	7	6	4	1.0675	3	6	4	6
B 9311-7	4	3	5	5	5	1.0743	3	4	5	6
B 9335-35	4	3	4	5	5	1.0834				
B 9423-4	4	3	5	4	5	1.0643	1	3	3	1
B 9510-5	7	2	5	6	4	1.0691	1	3	3	3+
B 9514-17	5	3	6	6	3	1.0675				
B 9528-10	6	2	5	7	3	1.0743	2	3	3	3+
B 9533-12	4	3	6	4	4	1.0731	2+	3	3	2
B 9536-11	5	3	5	4	2	1.0711				
B 9536-23	6	3	8	5	3	1.0686	2	4	3	6
B 9539-9	4	4	5	4	3	1.0781				
B 9541-14	5	3	5	6	3	1.0846	1	3	3	3
B 9541-44	5	4	5	5	4	1.0755				
B 9556-9	4	3	4	4	3	1.0858				
B 9581-2	6	3	5	6	4	1.0747	2	4	5	4
B 9581-10	6	2	7	7	3	1.0721	3	6	5	6
B 9602-12	5	2	4	5	2	1.0689	3	3+	3	2
B 9642-5	4	3	4	3	5	1.0753	3	6	5	7
B 9786-14	6	3	6	5	4	1.0645	2	4	5	5
B 9786-20	6	3	6	6	3	1.0776	2	3	4	5
B 9792-13B	5	2	6	6	5	1.0743	2+	3	3	2-
B 9792-69	6	2	5	6	4	1.0711	2	5+	4	4
B 9792-70	6	2	7	6	4	1.0713	1	2	3	3+
B 9792-84	5	3	4	4	5	1.0686	2+	5	4	3
B 9792-119	4	2	5	4	4	1.0768	5	5	4	6+
B 9792-136	4	3	6	4	5	1.0664	4	3	4	3
B 9792-159	5	4	5	2	4	1.0720	2-	6	6	6
B 9792-186	5	3	4	4	4	1.0745				
CF 76183-2	3	5	5	5	4	1.0623	1	2	3	2+
NY 71	6	2	6	6	4	1.0643	2+	4	4	2
U 715-64	5	2	7	6	3	1.0776	2	4	5	6
U 729-21	5	3	4	4	4	1.0598	4	3	3	6+

^{1/}, ^{2/} See appropriate footnotes Table 5.

Virginia Table 7. Tuber Ratings of Interregional and Advanced Russet Selections - 1984.

Clones	Tuber Ratings ^{1/}					Specific Gravity
	Uniformity	Shape	Size	Set	Appearance	
Interregional Russets						
BelRus	-	6	5	3	3	1.0778
GoldRus	-	6	6	4	4	1.0793
Norgold Russet	-	5	5	4	4	1.0642
B 9398-2	-	6	4	4	4	1.0766
B 9400-5	-	6	7	5	4	1.0611
B 9540-62	-	6	7	5	5	1.0734
B 9553-6	-	5	5	5	3	1.0678
B 9569-2	-	6	4	3	4	1.0745
B 9596-2	-	7	6	4	4	1.0613
B 9648-9	-	7	5	3	6	1.0665
Advanced Russets						
BelRus	3	7	4	2	3	1.0765
GoldRus	5	6	6	4	5	1.0753
Norgold Russet	4	6	4	3	3	1.0669
Russet Burbank	3	6	3	4	1	1.0644
B 9164-1	4	7	6	4	5	1.0753
B 9540-55	3	7	5	5	4	1.0656
B 9703-4	2	6	4	3	3	1.0676
B 9736-3	3	7	6	3	6	-

^{1/} See appropriate footnote Table 5.

Virginia Table 8. Yield and Tuber Ratings of Observational Selections -1984.

Clones	Total Yield >1-1/2" cwt/A	_____ % of Total Yield _____			_____ Tuber Ratings ^{1/} _____			_____ Skin		
		1-7/8 - 2-1/4"	2-1/4 - 3-1/2"	>3-1/2"	Uniformity	Shape	Size	Set	Appearance	Set
		Russet								
BelRus	128.4	29.4	26.2	0.0	5	6	4	4	5	5
GoldRus	121.4	26.8	41.6	0.0	3	6	5	4	6	4
Norgold Russet	143.5	25.9	30.0	0.0	3	6	5	6	4	3
B 9812-2	134.2	21.2	38.1	0.0	3	6	3	4	4	5
B 9882-12	120.0	20.7	39.2	0.0	3	5	4	4	4	4
B 9907-3	70.3	28.9	42.2	0.0	3	6	3	3	3	5
B 9926-5	126.0	24.5	31.5	7.6	3	6	4	3	4	2
B 9959-20	79.0	16.2	30.9	0.0	2	5	3	3	2	3
Slightly irregular.										
Severe sprouting and second growth.										
Round White										
Atlantic	176.0	16.8	50.2	10.2	4	2	6	4	4	2
Pungo	154.5	20.7	45.5	6.0	3	3	4	5	3	3
Superior	174.2	14.0	53.0	18.0	4	3	6	5	5	3
B 9792-88	204.4	13.6	42.9	23.3	5	3	6	6	6	5
B 9792-168	130.1	40.2	37.1	4.9	3	3	5	2	3	4
B 9792-198	164.9	17.6	40.5	15.5	4	3	5	4	4	5
B 9792-53	146.9	16.2	48.6	4.0	5	3	4	4	4	7
B 9792-78	123.7	22.4	46.3	2.4	5	3	4	4	5	3
B 9792-79	144.6	21.7	37.8	6.0	4	3	4	4	4	2
B 9792-113	158.6	21.1	43.3	7.1	3	3	5	5	4	3
B 9792-132	174.2	22.7	57.6	0.0	6	2	4	4	5	4
B 9792-144	193.4	15.0	42.3	28.5	4	4	5	4	4	4
B 9792-147	166.1	28.7	51.7	0.0	5	3	4	4	4	3
B 9792-157	163.8	16.7	57.1	6.4	4	3	7	5	4	5
B 9792-190	135.3	11.6	57.9	16.3	3	2	5	3	4	2
B 9792-193	176.6	20.4	45.7	9.2	4	3	4	6	4	2
B 9792-194	208.5	13.1	44.0	25.9	4	4	6	4	4	4
B 9792-196	169.6	23.3	49.7	3.8	4	3	4	5	4	2
B 9792-197	207.9	29.6	34.1	12.3	4	3	5	5	4	2
B 9956-7	174.2	22.2	49.6	12.2	5	4	5	6	5	3
B 9956-14	163.2	18.1	48.8	18.5	6	3	7	5	6	4
Slightly flat.										
Growth cracks and second growth.										
Slightly irregular.										
Slightly flat.										
Nice.										
Nice.										

^{1/}See appropriate footnote Table 1.

WISCONSIN

R. E. Hanneman, Jr.

Genetics and Cytogenetics of the Tuber-bearing Solanum Species. (Cooperative USDA, ARS and Wisconsin Experiment Station)

Assignment of Endosperm Balance Numbers (EBN) to the Tuber-bearing Solanum Species

The Endosperm Balance Number (EBN) concept was proposed to explain endosperm development in both interploidy-intraspecific and interspecific crosses. It requires EBN's to be in a 2:1 maternal:paternal ratio for normal endosperm development to occur. This concept is supported by data generated from interspecific crosses in potato and has proven useful in the manipulation of diverse germplasm.

The materials used represent a wide range of species from the Inter-Regional Potato Introduction Project (IR-1), Sturgeon Bay, Wisconsin, as well as several common U.S. cultivars. The EBN standards used were : 2x(1EBN) *S. cardiophyllum*, 2x(1EBN) *S. commersonii*, 2x(2EBN) *S. chacoense*, 2x(2EBN) Gp. Phureja, 4x(4EBN) Gp. Andigena, and 4x(4EBN) *S. chacoense*. They were used primarily as pollen parents. EBN was assigned based on the determination of the number of viable seeds per fruit and the ploidy of the offspring. All crossing was done using standard crossing techniques.

The EBN's of over 80 species and subspecies representing 12 taxonomic series have been determined, with no species assigned to more than one EBN level. Among North American species, most diploids are 1EBN, most tetraploids are 2EBN and all hexaploids are 4EBN; however, for South American species most diploids are 2EBN, most tetraploids are 4EBN and again all hexaploids are 4EBN. Thus species may be isolated from others of the same ploidy level by EBN difference, i.e. 4x(2EBN) from 4x(4EBN), while other species differing in ploidy but having the same EBN may be intercrossed, i.e. 4x(2EBN) and 2x(2EBN). Chromosome doubling or 2n gametes can be used to make a lower EBN species compatible with a higher EBN species. These findings also explain the major crossing difficulties previously inherent in the use of North American species in potato improvement.

They also have direct implications for potato improvement, barring the occurrence of other incompatibility barriers. Any 4x(4EBN) cultivar is endosperm compatible and thus will cross with 4x(4EBN) and 6x(4EBN) species. The 2x(2EBN) haploids of 4x(4EBN) cultivars likewise will hybridize with 2x(2EBN) and 4x(2EBN) species. All 2x(1EBN) species are crossable with 2x(2EBN) haploids through 2n gametes or chromosome doubling.

Utilization of Mexican Species Germplasm

The Mexican species, although a rich source of desirable characters, particularly disease resistance, have only with difficulty been incorporated into cultivated *Tuberosum*. This difficulty stems partly from the fact that Mexican species have one-half the Endosperm Balance Number (EBN) of their South American counterparts at the same ploidy level. Thus

intercontinental hybrids generally produce odd-ploid progeny. The goal of this research is to determine whether transgressive segregation for EBN is possible between Mexican species and certain exceptional South American species, avoiding the necessity of passing germplasm through an "odd-ploid bottleneck." The practical goal is to produce tetraploid stocks of Mexican species germplasm which, when crossed with Tuberosum, produce tetraploid progeny.

The exceptional South American species used was a diploid or colchicine induced tetraploid of S. commersonii. This South American species hybridizes interspecifically as though it were a Mexican diploid. At the diploid level, S. commersonii x Mexican diploid species hybrids were made. Although meiosis appears to be normal, pollen stainability is very low, precluding the possibility of selfing or sibling. The F_1 's themselves appear to cross only with 1 EBN species testers. One clone which was colchicine doubled has high pollen stainability. An effort is currently underway to double more of these F_1 diploids for subsequent selfing and testing for crossability with cultivars.

At the tetraploid level, hybrids between 4x S. commersonii and disomic tetraploid Mexican species of Series Longipedicellata were made. Initial crosses of these hybrids to 4EBN testers resulted in only aborted seeds. These hybrids are quite fertile, however, with high pollen stainability and up to 46 seeds per fruit when selfed. This may suggest that little differentiation exists between the genomes of Series Longipedicellata and S. commersonii. Although these hybrids did not cross well to cultivars directly, some of their self progeny do. The true hybridity and ploidy of the plants from each of these crosses are currently being verified.

A third possible approach involves both Mexican diploid and tetraploid species. In this case, doubled Mexican diploid species females were crossed with Series Longipedicellata species as males. These hybrids will be selfed and tested for crossability with cultivated Tuberosum as well.

Reciprocal
Differences and
Gametophytic
Selection in
Tuberosum-Andigena
Families

Large differences for yield have been detected in certain exact Tuberosum-Andigena reciprocal families. One of the possible explanations for this is gametophytic selection. The following research was undertaken to determine what role gametophytic selection might play in the large yield differences seen in these families.

Experiments were undertaken to determine what role gibberellic acid (GA) might play in gametophytic selection resulting in reciprocal family yield differences because reciprocal differences appear to be dependent on selection of parents of extreme maturities; because GA levels have been implicated in maturity, and because in some cases GA has been shown to be a strong promoter of pollen tube growth.

An Andigena clone, 11.1, producing large reciprocal differences and therefore suspect of segregation high and low GA-type pollen was selfed. An approximate 3:1 segregation of normal to dwarf plants was evident in the 11.1 selfed progeny. This suggests that 11.1 is simplex for a nuclear GA producing gene. Dwarfs could be restored to the normal phenotype by periodic spraying of their foliage with 50 ppm GA, but reverted to dwarfism when spraying was discontinued. The interaction of dwarfing and tuberization was very clear. At 65 days all dwarfs had set multiple tubers while only about one third of normal phenotype individuals had initiated tuberization.

Various pollinations were made with pollen that had been subjected to aqueous solutions of GA, the GA inhibitor "ancymidol," and water as a control. Although seed set from wet pollinations was quite variable, GA pollination always produced more seed than "ancymidol" or water pollinations. This suggests that GA may influence pollen survival in these crosses. One year's field data demonstrated consistent and significant yield reduction in GA pollinated families. These differences were not detected this year. One difference which was noted, however, was that in each of four blocks observed, dwarf plants occurred as about 2-3 percent of the normal cv. Superior x 11.1 family, while they were completely absent in the identical GA pollinated family. Families resulting from wet pollinations are currently being evaluated for the proportion of dwarfs they contain.

At present the link between GA, dwarfism, gametophytic selection, and tuberization/yield is unclear. If dwarfism and yield differences are related, as they seem to be, however, the evaluation of the number of dwarfs in wet pollinated families and the dwarf proportion and yield differences when these segregants are used as parents may help to elucidate the role of gametophytic selection in reciprocal yield differences.

Self Fertility in Solanum chacoense

Several lines of S. chacoense have been inbred to the S₄ to S₆ generation. Inbreeding was begun in an attempt to associate the S-locus with a specific chromosome using the trisomic series. This effort was given up when it was determined that self-compatibility may have been introduced into some of the trisomic lines. In this study, nearly half of the progeny of several families set over 100 seeds per fruit. The range in seeds per fruit across all families was 0-590 with family averages ranging from 3-108. While rigorous genetic analysis has not been done, and may be confounded by pseudo-self-compatibility, selfing rates among the selected families can be explained with as few as two dominant genes being involved.



